ENVIRONMENTAL ASSESSMENT

High Prairie 161 kV Substation, 161 kV High Voltage Transmission Line, and Modifications to Adams Substation in Mower County

High Prairie Wind Farm I, LLC
High Prairie Wind Farm II, LLC
FPL Energy Mower County, LLC

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1 Introduction

1.1 Project Description

High Prairie Wind Farm I, LLC and FPL Energy Mower County, LLC propose to construct, operate, maintain, and own a new 161 kV substation (Wind Farm Substation) in Section 23 of Clayton Township in Mower County, Minnesota. The two companies, along with High Prairie Wind Farm II, LLC (the Applicants) also propose to construct, operate, maintain, and own a new high voltage transmission line (HVTL). The alternating current HVTL will connect the proposed High Prairie Wind Farm (Wind Farm) to the Adams Substation in Lodi Township. The line, which will require a new right-of-way, will be approximately seven (7) miles in length. Construction of the Wind Farm Substation and HVTL, and modifications to the Adams Substation (all together, the Project), are expected to be completed by December 2006. The Project is located in Lodi Township Sections 4, 7, 8 and 18 and Clayton Township Sections 23, 26, 27, 28 and 33, as shown in Figure 1 below.

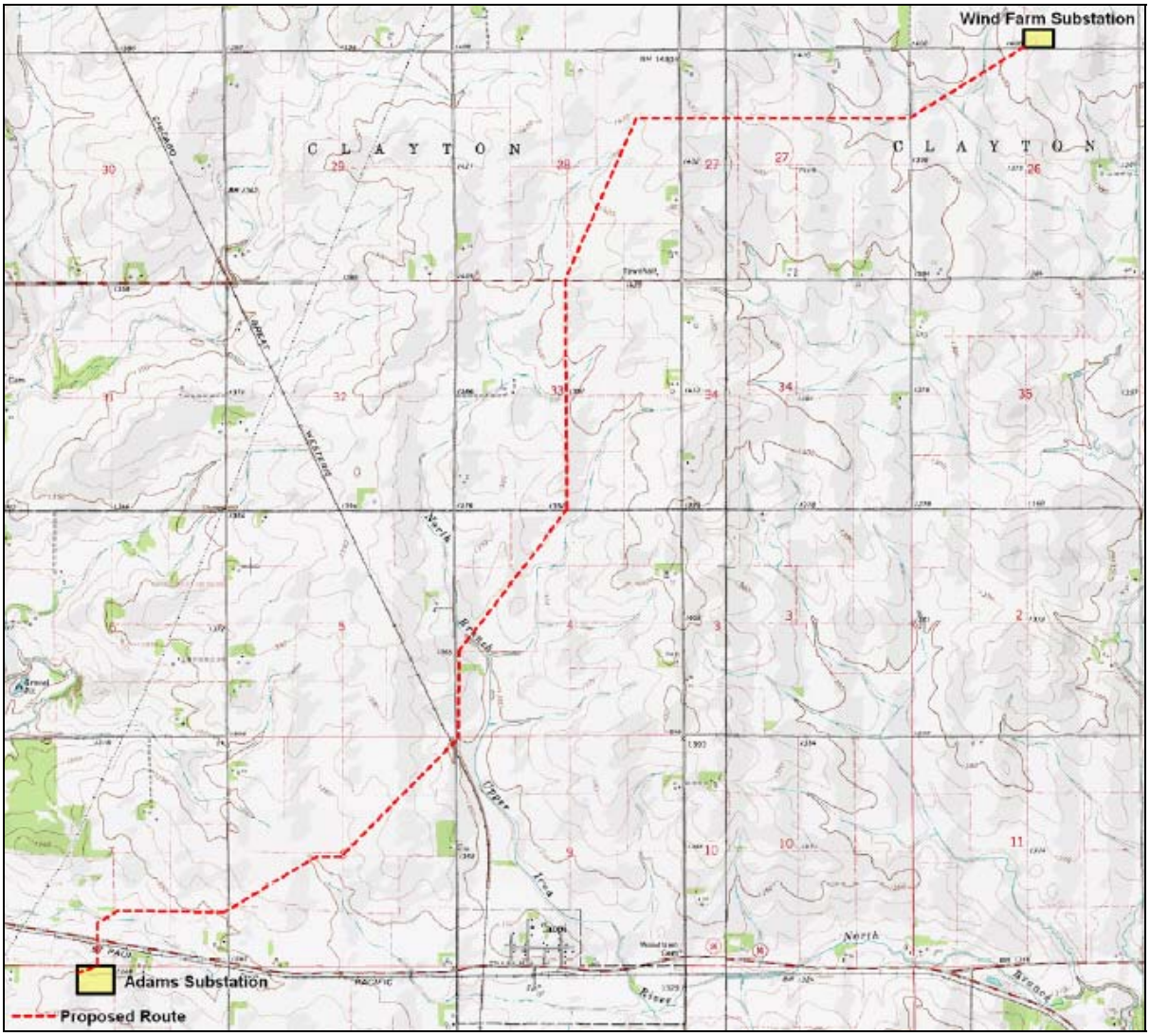

Figure 1 - Project Layout

1.1.1 Wind Farm Substation

Power from the Wind Farm, whose LWECS Site Permit Application is currently being reviewed by the Minnesota Public Utilities Commission, will be brought to the Wind Farm Substation via underground and overhead electrical cables. The voltage will be increased from 34.5 kV to the HVTL voltage of 161 kV at the Wind Farm Substation.

The Wind Farm Substation is located on the north side of 180th St in the southwest corner of the southeast quarter of Section 23 in Clayton Township. It will occupy a fenced area of approximately 200 feet by 250 feet. Major equipment located within the substation includes:

1. Transformer with a voltage rating of 161 kV/34.5 kV.
2. 16 foot by 24 foot building that will contain substation equipment protective gear and backup power facilities.
3. Circuit breakers to provide protection to underground lines serving the wind plant.
4. Steel structures to support the new 161 KV transmission line, insulators, switches and high voltage conductors.
5. Steel monopolar structures to provide lightening protection.
6. Self-supporting metering equipment.
7. Self-supporting switches and associated support structures.
8. Security lighting.

The entire facility will be enclosed within a chain link fence with a locked gate. The area bounded by the chain link fence will be graveled to a depth of approximately six inches. This gravel cover will extend outside the fenced area by a distance of four feet around the entire circumference of the fenced area. A short graveled road and associated drainage culvert will be installed to allow access to the substation from the existing township road.

1.1.2 HVTL

The new single-circuit 161 kV HVTL will be approximately seven (7) miles in length. The preferred route for the HVTL will begin at the existing Adams Substation and proceed for approximately 800 feet due north and then continue approximately 800 feet northeast. From there it continues due east adjacent to an existing 69 kV transmission line about 1960 feet to 690th Avenue. At the junction of the existing 69 kV transmission line right-of-way and 690th Avenue, the transmission line will go east northeast for approximately 2900 feet. It then turns back slightly more northeast for another 3800 feet and then proceeds due north along the east side of 700th Avenue in existing right-of-way for a distance of approximately 2043 feet. From there it continues northeast for nearly 4000 feet before turning due north bisecting Section 33 in Clayton Township for approximately 1 mile. At 170th St on the north side of Section 33, the line proceeds northeast for approximately 4040 feet before turning due east for around 475 feet to SR 9 where it will continue east for approximately 1 more mile. At this point, the line will turn northeast for approximately 3080 feet entering the Wind Farm Substation which is located on the north side of 180th St in the southwest corner of the southeast quarter of Section 23 in Clayton Township.

The HVTL will be separated by approximately 60 feet when paralleling the existing transmission line. Right-of-way easements are expected to be 50 feet in width, except when located along road right-of-ways, in which case they are expected to be 10 feet in width. The transmission line will be designed to accommodate existing low voltage electric utility lines when local right-of-

way conditions require the need to do so, as well as an underbuilt 34.5 kV feeder line bringing power from turbines adjacent to the HVTL back to the Wind Farm Substation.

The HVTL will primarily utilize single wood, steel, or cement poles mounted with post-type 161 kV insulators. The structures will be 65 to 70 feet above the ground and the HVTL will have a span of between 300 to 500 feet. Depending on the type of pole chosen once engineering is complete, some of the poles may be need to be guyed. If necessary, this will typically occur at corners and offsets. Two pole H-frame style structures may be used in several locations to avoid interfering with existing electrical lines or other conditions.

1.1.3 Adams Substation

The HVTL will terminate in the existing Adams Substation, located approximately 3 miles southeast of the community of Adams, Minnesota. The Adams Substation is jointly owned by Xcel Energy, Dairyland Power Cooperative, Southern Minnesota Municipal Power Agency, and Interstate Power & Light Company.

The Adams Substation has adequate room and facilities to terminate the new 161 HVTL without a physical expansion of the substation. The new transmission line will terminate in an existing substation bay that is currently not being used. It will be necessary to add a circuit breaker, associated foundations, conductor deadend structure, insulators, and protective equipment to accommodate the new transmission line.

1.2 Project Purpose

The proposed 161 kV HVTL is intended to connect power produced from the proposed High Prairie Wind Farm to the grid by connecting the Wind Farm Substation to the Adams Substation. The Applicants have executed interconnection agreements with Alliant Energy and the Midwest Independent System Operator to connect the HVTL to the Adams Substation. The Wind Farm, which is currently under review by the Minnesota Public Utilities Commission for a Site Permit for a large wind energy conversion system (Minnesota Rules Chapter 4401), is intended to supply power to Xcel Energy that was solicited through Xcel's 2001 All Source Solicitation Process. The major benefit of this transmission line is that it will allow wind energy that is needed by Xcel Energy to be delivered to the market.

1.3 Alternative Routes

Two alternate routes were chosen in the event that the proposed route, or sections thereof, is determined to be infeasible. Should such conditions arise, all or portions of these alternate routes may be utilized. These routes are shown in Figure 2 below.

1.3.1 Alternate Route 1

Alternate Route 1 (AR1) will be approximately 7 ½ miles in length. AR1 would begin at the existing Adams Substation and proceed for approximately 800 feet due north and then continue approximately 800 feet northeast. From there it continues due east adjacent to an existing 69 kV transmission line about 1960 feet to 690th Avenue. At the junction of the existing 69 kV transmission line right-of-way and 690th Avenue, AR1 will go east northeast for approximately 2900 feet. It then turns back slightly more northeast for another 3800 feet and then proceeds due north along the east side of 700th Avenue in existing right-of-way for a distance of approximately

1 mile to the intersection of 160th Street and 700th Avenue. It then goes due east approximately 1 mile to the intersection of 170th Street and CR 9. It then proceeds due north approximately 2 miles to the intersection of 180th Street and CR 9 and then due east about 1.5 miles into the Wind Farm Substation which is located on the north side of 180th St in the southwest corner of the southeast quarter of Section 23 in Clayton Township.

1.3.2 Alternate Route 2

Alternate Route 2 (AR2) will be approximately 7 ½ miles in length. AR2 will begin at the existing Adams Substation and proceed for approximately 800 feet due north and then continue approximately 800 feet northeast. From there it continues due east adjacent to an existing 69 kV transmission line about 1960 feet to 690th Avenue. At the junction of the existing 69 kV transmission line right-of-way and 690th Avenue, the transmission line will go east northeast for approximately 2900 feet. It then turns back slightly more northeast for another 3800 feet and then proceeds due north along the east side of 700th Avenue approximately 2 miles to 170th Street. From there it continues due east approximately 2 miles and then due north approximately 1 mile along 720th Avenue. At this point, it goes due east along 180th Street about ½ mile into the Wind Farm Substation which is located on the north side of 180th St in the southwest corner of the southeast quarter of Section 23 in Clayton Township.

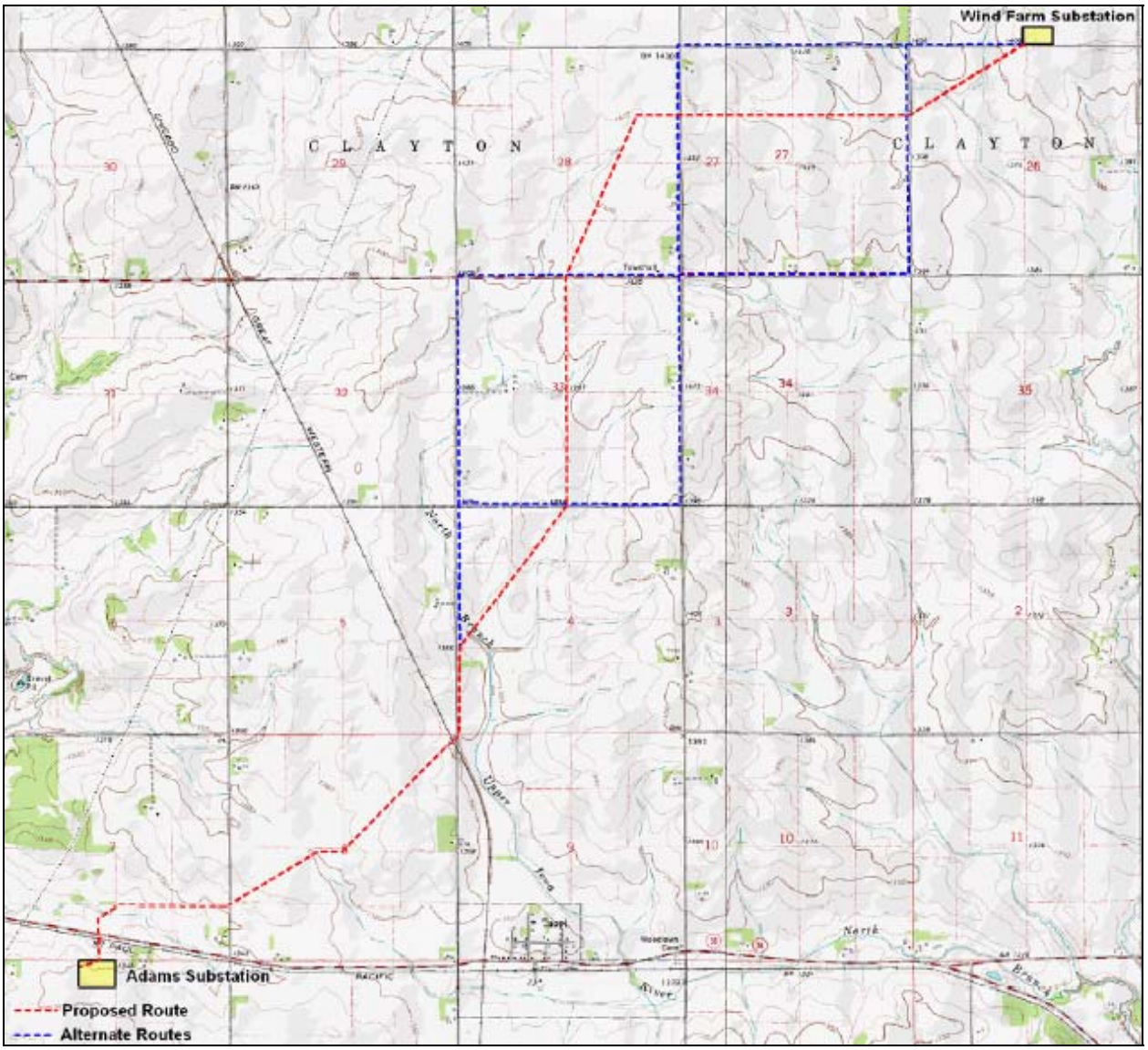

Figure 2 - Alternate Routes

2 Regulatory Framework

2.1 Conditional Use Permit Requirement

This Project falls under the Power Plant Siting Act, Minnesota Statutes 116C.51-.69 and Minnesota Rules Chapter 4400. In accordance with Minnesota Rule 4400.5000, an applicant who seeks a route permit for a substation with a voltage designed for and capable of operation at a nominal voltage of 100 kilovolts or more, and/or a high voltage transmission line of between 100 and 200 kilovolts, has the option of applying to those local units of government that have jurisdiction over the route for approval to build the project. If local approval is granted, a route permit is not required from the PUC. The Applicant has elected to seek a Conditional Use Permit from the Mower County Board for the substation and HVTL route.

2.2 Environmental Assessment Requirement

In accordance with Minnesota Rule 4400.5000 Subp. 5, an environmental assessment must be prepared for the Project. The environmental assessment contains information on the human and environmental impacts of the proposed substation and route and addresses any mitigating measures of any impacts of the Project. In accordance with the rule, Mower County offered the public an opportunity to comment on the scope of the environmental assessment. The County mailed invitations to a public meeting and copies of the draft scope to the landowners on the proposed route, the town boards of Clayton and Lodi Townships, and the Mower County Planning Commission. The scope was presented at the Mower County Planning Commission meeting on December 20, 2005. This meeting offered the public the opportunity to learn about the Project, to suggest alternative routes, and to contribute to the scope of the EA by identifying issues that need to be addressed. No member of the public raised concerns about the scope of the environmental assessment.

2.3 Certificate of Need Requirement

No Certificate of Need is required for this Project. As the HVTL is under 200 kV, under ten miles in length, and does not cross a state line, the Project is exempt under Minnesota Statute 216B.2421 Subd. 2.

2.4 Other Permits and Approvals Required

A list of permits and approvals required for the construction of the Project is included in Table 1 below.

Table 1 - Required Permits and Approvals

Permit	Permitting Agency	Trigger	Permit Required
FEDERAL			
Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers; St. Paul District Office	Discharges of dredged or fill material into waters of the United States, including their adjacent wetlands.	TBD
STATE OF MINNESOTA			
General NPDES Permit for Stormwater Discharges Associated with Construction Activities	Minnesota Pollution Control Agency (MPCA)	Disturbance of greater than 1 acre of ground.	Yes
Section 401 Water Quality Certification	MPCA	Impacts to waters of the US (Corps Section 404 permit)	TBD
License for Crossing Public Lands and Waters	MN DNR	Any wind farm facilities that require crossing of or location on State administered Public Lands or Waters	TBD
Public Waters Work Permit	DNR	Any construction activities that impact waterways, including wetlands. Applies to public waters that are identified on DNR public waters inventory maps.	TBD
Highway Access Permit	MN Dept. of Transportation	Access to State roads from facilities.	Yes if off Highway 56 or 16
Utility Access Permit	MN Dept. of Transportation	Utility construction impacts to state roads	Yes
Oversize & Overweight Permit	MN Dept. of Transportation	Use of oversize and overweight vehicles	Yes
MOWER COUNTY			
Highway Access Permit (County and Local Roads)	Mower County Engineer and Township Chairs	Access to county and local roads from facilities.	Yes
Zoning Permit	Mower County Office of Planning and Environmental Services	Construction of facilities	Yes
Conditional Use Permit (requires an environmental assessment)	Mower County Office of Planning and Environmental Services	Construction of transmission line	Yes

3 Assessment of Impacts and Mitigation

3.1 Description of Environmental Setting

The Project is located approximately 60 miles west of the Mississippi River on a low ridge serving as a drainage divide between several local watersheds (Map 1). The Project Area is defined as the area 0.25 miles either side of the HVTL and substations (Map 2). Elevations in Mower County range from 1,150 feet to 1,440 feet above mean sea level (MSL). The surrounding land is agriculturally developed with crop fields, grazing land, scattered rural residences, and other agricultural operations dominating the landscape.

The Project is primarily located in the Western Corn Belt Plains ecoregion described below:

"Once covered with tallgrass prairie, over 75 percent of the Western Corn Belt Plains is now used for cropland agriculture and much of the remainder is in forage for livestock. A combination of nearly level to gently rolling glaciated till plains and hilly loess plains, an average annual precipitation of 63-89 cm, which occurs mainly in the growing season, and fertile, warm, moist soils make this one of the most productive areas of corn and soybeans in the world. Major environmental concerns in the region include surface and groundwater contamination from fertilizer and pesticide applications, as well as impacts from concentrated livestock production (USEPA 2006)"

3.2 Socioeconomics

3.2.1 Description of Resource

The Project is located in Mower County, a rural area in southeastern Minnesota. Baseline data for the county include population and demographic data, as well as current business and economic statistics information. Information in this section was obtained from the U.S. Census Bureau based on the 2000 census data, as reviewed, updated, and reported each year, and on the 2002 Economic Census.

Mower County comprised 712 square miles with 54.3 people per square mile and a total population of 38,603 people in 2000. Mower County grew by 3.3 percent between 1990 and 2000 and an estimated 1.0 percent between 2000 and 2004. The median age in Mower County was 38.9 years, with 31.2 percent of the population under the age of 18 and more than 19 percent 65 years or older in 2000. The population of minority and low-income populations in the county and state are shown in Table 3-1.

Table 3-1. Minority Populations and Low-Income Populations, Mower County, 2000

Location	Total Population	Percent Minority*	Percent below Poverty (1999)**
Mower County	38,603	7.0	9.2
State of Minnesota	4,919,479	11.8	7.9

Source: U. S. Census Bureau 2005
*Minority populations are persons of Hispanic or Latino origin of any race, Blacks or African Americans, American Indians or Alaska Natives, Asians, and Native Hawaiian and other Pacific Islanders.

**Low-income populations are persons living below the poverty level. In 2000, the poverty weighted average threshold for a family of four in the United States was $17,603 and $8,794 for an unrelated individual.

Austin is the largest city and county seat of Mower County. The Project is located in Lodi and Clayton townships. There are several small rural communities adjacent to the Project Area including Taopi, Adams, Dexter, and Elkton. According to the City of Adams web page, the Southland Consolidated School District provides educational services to K-12 pupils in the area (City of Adams 2005).

The 2000 U.S. Census reports that there were 15,582 housing units in Mower County with 2.42 persons per household. Mower County had a home ownership rate of 78.2 percent in 2000. The median housing value was $71,400, which is significantly less than the state average of $122,400. Median household income was $37,859 in 2002, just 75 percent of the state median household income of $50,157. (U.S. Census Bureau 2005).

The 2002 Mower County Comprehensive Plan estimates that the county population will increase by 1,290 people by 2010, resulting in an estimated census population of approximately 40,000 people, with most of the new growth concentrated adjacent to the I-90 corridor.

Mower County has a long record of economic stability due in part to Hormel Meat Company, which produces "Spam" at its facility in Austin. Over 85 percent of all manufacturing employment (4,347) is classified as food manufacturing (3,745) and over 90 percent of the manufacturing annual payroll ($176,193,000) is from the food manufacturing sector ($159,190,000). Other major employers include: the Austin Medical Center; Mayo Health Systems; various other manufacturing businesses; commercial businesses, including accommodation and food services; all levels of government and education; and agricultural operations. Approximately 1,818 people worked in government jobs (federal, state, local, schools) in 2000. A summary of the non-farm jobs and payroll for Mower County is shown in Table 3-2.

Table 3-2. Non-farm Private Employment by Industry, 2002, Mower County

Industry	2002	Annual Payroll ($1,000)
Total Non-farm Private Employment	14,498	
Manufacturing	4,347	176,193
Wholesale Trade	343	10,747
Transportation & warehousing	332	8,151
Construction	555	19,355
Retail Trade	1,918	32,732
Information	167	4,458
Finance & insurance	507	18,740
Professional, scientific and technical services	242	11,418
Administrative & support & waste management & remediation service	397	13,511
Educational services	94	1,553
Health care & social assistance	2,468	61,043
Arts, entertainment, & recreation	80	1,599

Industry	2002	Annual Payroll ($1,000)
Accommodation & food services	1,249	10,366
Other services (except public administration)	970	1,724
Other non-farm private employment, not included in county data	829	

Source: U. S. Census Bureau 2002

Agriculture is an important activity in the county, including businesses that support agriculture and provide basic commercial services to local residents. Direct agricultural employment in Mower County was estimated at 926 in 2000, approximately six percent of the total workforce. Total market value of agricultural products produced from farms in Mower County was $178,681,000, including $105,467,000 in crops and $73,214,000 in livestock and poultry. There were 1,088 farms in Mower County in 2002, with a median size of 186 acres (just over a quarter section) (USDA 2002).

Unemployment in Mower County has consistently remained slightly lower than that of the entire state of Minnesota, with 4.6 percent of the state work force being unemployed in 2002, and 4.0 percent of the Mower County being unemployed in 2002 (USDA 2005).

3.2.2 Impacts

Economic impacts are described as the amount of money and/or employment that the Project may deliver in terms of:

- Employment;
- Income;
- Government costs and tax revenues.

Construction of the Project is anticipated to cost several million dollars for labor and equipment and be complete within nine months following commencement of construction. During construction and operation, the Project will function as a “basic industry” in Mower County, the Southeastern Region, and the State of Minnesota. Basic industries are those business and government activities which bring outside income into an area economy. Income from sources outside the area that is received as paychecks and spent generates additional income and employment in the area, which is called the multiplier effect. Construction employment accounts for less than four percent of the Mower County workforce. If local contractors are employed for portions of the construction, total wages and salaries paid to contractors and workers in Mower and adjacent counties will contribute to the total personal income of the region. Additional personal income will be generated in the local, regional, and state economies due to the multiplier effect of each dollar paid in salaries and wages. Multipliers used for basic industries are estimated to be between one and three times the original salary and wages. This multiplier effect occurs as earners buy goods and services locally with the money earned and contribute to local, state and national taxes. Purchase of goods such as energy, fuel, operating supplies, and equipment also generate sales tax revenues.

Long-term impacts to the Mower County tax base, as a result of the construction and operation of the Project, will contribute to the local economy in southeastern Minnesota. Development of energy projects in this region is important in diversifying and strengthening the economic base and encouraging economic growth of the region and the local counties where energy projects are located. County government expenses are not expected to increase because of the Project. Leading industries in Mower County, including Hormel, are not expected to be impacted during construction or operation of the Project.

There is no indication that an environmental justice population (minority, including Native Americans, or low income) exists in the county or that the Project will be placed in an area occupied primarily by any minority group.

3.2.3 Mitigation

Socioeconomic impacts associated with the Project will be primarily positive. These positive impacts result from the influx of wages and purchases made at local businesses during Project construction, an increase in the county's tax bases from the construction and operation of the Project and payment to landowners for easements may also benefit landowners. Since impacts resulting from the Project are expected to be beneficial to the local community rather than detrimental, specific mitigation is not required.

3.3 Noise

3.3.1 Description of Resource

The Project is located in a rural, predominantly agricultural area. Sources of background noise audible to rural residents and visitors to the area include wind, agricultural activity, recreation (primarily hunting), and vehicles. General noise level data from the USEPA and National Transit Institute were used to provide a typical sound level range for rural residential and agricultural cropland uses. Typical baseline average day-night sound levels measured in A-weighted decibels [dB(A)] near the Project likely range from approximately 38 dB(A) to 48 dB(A) (USEPA 1978). These are relatively low background levels and are generally representative of the site. Higher levels exist near roads and other areas of human activity. The windy conditions in this region may elevate ambient noise levels relative to rural areas with less wind. Typical levels of sounds in various settings and from various sources are presented in Table 3-3.

Table 3-3. Noise Levels from Common Sources Expressed in A-weighted decibels [dB(A)].

db(A)	Typical Source
130	Pneumatic drill
120	Loud car horn one meter away Air raid siren at 50ft
110	Airport Rock Concert
100	Along mainline railway
90	Inside bus Motorcycle at 25ft
80	Busy residential road
70	Conversational speech

60	Living room with music or television playing quietly Air conditioning unit at 100ft
50	Quiet office
40	Bedroom Low limit of urban ambient sound
30	Recording Studio
20	Broadcasting Studio Leaves rustling
10	Threshold of hearing
0	No sound

3.3.2 Impacts

Noise is defined as any unwanted sound. Noise can have such subjective effects as annoyance, nuisance, and dissatisfaction, and can also interfere with activities such as speech, sleep, and learning. Physiological effects such as anxiety, tinnitus, or hearing loss can also occur as a result of noise exposure. Contribution to hearing loss can begin at levels as low as 70 dB(A)

The National Safety Council (NSC) recommends no more than 85 dB(A) for eight hours of exposure as the safe limit for farm operations. Industrial standards of the Occupational Safety and Health Administration (OSHA) regulations would apply during construction, operation and maintenance of the facility. Short-term noise issues would be related to construction of the Project; long-term issues would be related to operation of the facility. Noise generated by construction activities would occur intermittently over the construction period during daytime hours and would be generated by an increase in traffic on local roads, as well as heavy equipment operation. Available estimates from other construction projects indicate that the maximum noise levels from heavy equipment would be 85 to 88 dB(A) at a distance of 50 feet (Western 2003).

During operation of the Project, noise will be emitted by the HVTL and substation. Corona-generated audible noise from HVTL operation is generally characterized as a crackling, hissing noise. The noise is most noticeable during wet-conductor conditions such as rain, snow, or fog. The average noise-level during wet weather at the edge of the ROW for the proposed HVTL is expected to be less than 45 dB(A). The noise (L_{50}) standard is 50 dB(A) for nighttime (Minn. Rule 7030.0040). Noise from a typical substation is less than 65 dB(A); however, the closest residence to the new substation at the north end of the proposal HVTL is approximately 0.5 miles. Given the distance of residences from the HVTL and substations, it is anticipated that the noise standards would be met.

3.3.3 Mitigation

Noise impacts to nearby residents and other potentially affected parties were taken into consideration as part of the siting of the HVTL route. Therefore, no mitigation measures are anticipated.

3.4 Visual Resources

3.4.1 Description of Resource

Scenic quality is determined by evaluating the overall character and diversity of landform, vegetation, color, water, and cultural or manmade features in a landscape. Typically, more complex or diverse landscapes have higher scenic quality than those landscapes with less complex or diverse landscape features.

The Project lies in a rural location with farming, livestock grazing, and related agricultural operations dominating land use. Agricultural fields, farmsteads, fallow fields, and large open vistas visually dominate the area surrounding the Project and the topography is relatively flat with gently rolling hills. The landscape can be classified as rural open space where the visual resources of the area are neither unique to the region nor entirely natural.

Structure and color features in the visual region of influence include those associated with wetlands, cultivated cropland, pasture, forested shelterbelt, and additional anthropogenic features such as farmsteads and other structures. Colors are seasonally variable and include green crop and pasture land during spring and early summer, green to brown crops and pasture during late summer and fall, brown and black associated with fallow farm fields year round, and white and brown associated with late fall and winter periods. The settlements in the vicinity of the Project are primarily residences and farm buildings (inhabited and uninhabited) surrounded by forested shelterbelts located along the rural county roads. These structures are focal points in the dominant open space character of the vicinity.

Key observation points (KOPs) are viewing locations that represent the location of the anticipated concentration of sensitive viewers (or the highest incidence of sensitive viewers) near the Project. KOPs for the Project include roadways and occupied residences within the vicinity of the Project and could include receptors in the nearby town of Taopi (see Map 3). There are approximately eight farmsteads, with at least one residence each, within Project Area. Currently, there are no distinctive landscape features in the Project Area that would require specific protection from visual impairment.

3.4.2 Impacts

The HVTL would bisect the rural areas from the turbine array to the substation and continue southwest to the point of interconnection at the Adams Substation. The HVTL would be 60 to 100 feet tall and would be visible from State Highway 56, local roads, and many of the occupied residences. The appearance of the HVTL would result in changes to the aesthetics of the landscape. Potential andowner concerns regarding visual and other impacts are a consideration in the ROW agreements negotiated along the route.

Impacts on visual resources within the vicinity of the Project were determined by considering the post-construction views from the KOPs, as discussed above in Section 3.3.1. Implementation of setbacks during facility siting and the process of negotiating agreements with the landowners in the vicinity of the Project lessen the perceived impacts in the area. The vicinity of the Project Area does not contain any highly distinctive or important landscape features, registered cultural resources, or unique viewsheds.

3.4.3 Mitigation

The following are proposed measures to mitigate visual impacts:

- Existing roads will be used for construction and maintenance where possible, minimizing the need for new roads; and
- Temporarily disturbed areas will be converted back to cropland or otherwise reseeded to blend in with existing vegetation.

3.5 Public Services, Infrastructure, and Traffic

3.5.1 Description of Resource

The Project is located in a lightly populated, rural area in southeastern Minnesota. There is an established transportation and utility network that provides access and necessary services to the light industry, small cities, homesteads, and farms existing near the Project Area. The community of Taopi is adjacent to the Project Area as shown on Map 1.

County and township roads that run coincident with section lines characterize the existing roadway infrastructure adjacent to much of the Project Area. These local roads have an Average Daily Traffic (ADT) of between 75 and 85 vehicles per day. For purposes of comparison, the functional capacity, or ADT, of a two-lane paved rural highway is in excess of 5,000 vehicles per day. The 2004 MNDOT average traffic count on Highway 56 west of Taopi near the Adams Substation is 1,600 vehicles per day (MNDOT 2004).

3.5.2 Impacts

The Project is expected to have a minimal effect on the existing infrastructure. The following is a brief description of the impacts that may occur during the construction and operation of the Project:

• *Electrical Service*. At the Wind Farm substation, the electric voltage will be stepped up to 161 kV and then transmitted over the eight-mile HVTL to the Adams substation, where it will enter the grid. During these activities local electrical service will not be disrupted.

• *Roads & Traffic.* The construction of roads in association with the Project is not anticipated. Access easement agreements will be obtained prior to construction and will be maintained to allow for access to transmission facilities during the operation of the Project. Motor vehicle traffic in the vicinity of the Project Area would temporarily increase during the construction phase. The maximum construction workforce is expected to generate approximately 100 additional vehicle trips per day. Since many of the roadways have minimal ADT, the addition of 100 vehicle trips may be perceptible, but would still be less than seasonal variations such as autumn harvest and well below the functional capacity of the roads.

• *Water Supply.* Construction and operation of the Project will not impact the water supply, nor require appropriation of surface water or dewatering of underground aquifers. The installation or abandonment of wells is not required.

• *Telephone and Fiber Optic.* Construction and operation of the Project will not impact telephone and/or fiber optic service in the vicinity of the Project Area. These service providers will be contacted prior to construction to locate and avoid underground facilities. To the extent project facilities cross or otherwise affect existing telephone or fiber optic lines or equipment, the Applicant will enter into agreements with service providers so as to avoid interference with their facilities.

3.5.3 Mitigation

Construction and operation of the proposed project will be in accordance with all associated federal and state permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on existing infrastructure during Project construction and operation, mitigation measures are not anticipated.

Damage, if any, to public roads will be repaired in accordance with applicable laws and permits and damage to private roads will be promptly repaired unless otherwise negotiated with the affected landowner. Traffic management and control of the local roadways would be considered in the planning and implementation of the Project construction, especially when crossing public roads. With these measures, the potential for traffic disruptions are low. Consultation with local utilities would identify phone and other lines that may be affected so that impacts can be minimized and avoided where possible.

3.6 Cultural and Archaeological Impacts

3.6.1 Description of Resource

The Cultural Study Area consists of a 12 mile search radius from the center of Section 35, T102N, R15W located within the Project Area as shown in Map 4. The following sections summarize the Cultural and Historical Resources Report presented in Appendix B.

Background Research

Background research and evaluation of existing datasets was conducted to identify and explicate known areas of archaeological concern, and to identify and provide a framework for investigating areas that may warrant Phase I level field investigation. This standard background research consisted of many tasks including: investigation of known archaeological records and previous archaeological research as documented in State Historical Preservation Office (SHPO) records; investigation of known archaeological sites and previous archaeological research as documented in published sources; location and analysis of available historic maps; location and analysis of current and historical environmental information; comparison of environmental context of the Cultural Study Area to the context of the closest known archaeological sites; and introduction of basic information into a GIS system for analysis.

Mower County lies within the Minnesota and northeast Iowa morainal section of the state. This area is marked by glacial end moraines and outwash plains, and corresponds to a transitional zone from the prairie (to the southwest) and the woods (to the northeast). The Cultural Study Area is predominately situated on glacial till of unknown origin, with southeast and south central areas that include some fluvial sediment. The Cultural Study Area is till-dominated and the Grand Meadows area is bedrock-dominated. The original Public Land Survey mapped this area

in 1853. The survey noted few lakes and some small streams. Prairie was noted as the predominant vegetation type. The Trygg Map (1850), derived from the public land survey, noted the Cultural Study Area as an area "Good for Grass," and the area just south of the Cultural Study Area as "Good" to "Excellent Farming Land". The area of the Cultural Study Area has probably been prairie since A.D. 300. The environmental setting of Mower County for past peoples has been defined not just by geology, but also by climate. Relatively minor shifts in temperature and wetness can cause habitats to shift, and the vegetation types in the vicinity of the Project Area may have changed significantly in the past.

Previous Archaeological Work

No known archaeological research has been conducted within the Cultural Study Area and archaeological research in Mower County has been limited. The earliest professional investigations date to the late nineteenth century, when Theodore H. Lewis and Alfred Hill of the Northwestern Archaeological Survey conducted an exhaustive survey of American Indian burial mounds and earthworks throughout the upper Midwest. In 1911, Newton H. Winchell synthesized his own research, as well as the work of Hill, Lewis and others, in *The Aborigines of Minnesota* (Winchell 1911). In the late 1930s and early 1950s, L. A. Wilford of the University of Minnesota published a number of field investigations in Mower County (Wilford 1939, 1951, 1952). In 1977, the Minnesota Legislature created the Minnesota Statewide Archaeological Survey. The program systematically sampled portions of Mower County between 1977 and 1980, locating a substantial number of previously unknown archaeological sites including the Grand Meadow Quarry Site (21 MW 8) located approximately 7.5 miles north of the north end of the HVTL and outside of the Project Area.

Recorded Archaeological Sites

Maps illustrating the known archaeological sites in the region are shown in Appendix B. None of these sites fall within the Project Area.

Analysis of the Andreas 1874 Atlas indicates several potential historic archaeological sites in or adjoining the Cultural Study Area. Comparison of the Andreas Atlas to more heavily occupied areas of Mower County shows a strong correlation to current structures and structures indicated in the atlas. Structures and sites that are potential archaeological features within the proximity of the Cultural Study Area are identified in Table 3-4.

Table 3-4. Structures and Sites with Potential Archaeological Features.

Historic Site	Location	Airphoto Interpretation
Schoolhouse	T102 R15 Sec. 28, SE ¼	Modern farm on site.
House (B. Kennedy)	T102 R15 Sec. 27, SE ¼	Anomaly in field. Modern farm 0.14m to west.
House (J.C. Miller)	T102 R15 Sec. 34, SW ¼	Possible anomaly in field.
F. Bullis Property	T101 R15 Sec. 9, NW ¼	No indications.
HA & FA Wales Property	T102 R14 Sec. 29, NE ¼	Modern farm on site.
EW Road	T102 R15 Sec. 31 ¼	Road clearly visible in field.
EW Road	T102 R15 Sec. 35-36.	Traces of road visible in field.

Prehistoric Period
Archaeological sites in the plains tend to be small and randomly dispersed, with a high number of temporary locations, making probability mapping difficult and less than reliable. Moreover, unlike the lake-filled areas of northern Minnesota, sites in southeastern Minnesota do not cluster around water sources (Gibbon et al. 1995).

In the Cultural Study Area, the only areas that can be singled-out for high probability of containing archaeological sites are the headwaters of the Upper Iowa River and the North Branch of the Iowa River. These two areas are the most obvious sources of water in the area, and likewise provide the highest potential for exposures of lithic raw materials.

The area holds moderate to high potential for lithic procurement and reduction sites associated with some of the widely-traded lithic raw materials of the area. While there is currently no evidence of quarrying or lithic activity in the Cultural Study Area, this may largely be due to the Cultural Study Area never having been subjected to survey. The Cultural Study Area does not contain exposed or near-surface bedrock as does the nearby Grand Meadows site (21MW8), and this reduces the probability of major lithic procurement sites in the area. However, the Project will be constructed on glacial till, which also provided lithic raw materials.

Historic Period
Areas of high historic probability are indicated on Map 4. One historical structure, a School House (MW-BEN-001), may be located in the northeast corner of T102N, R14, Sec. 18 (Cinadr 2005) which is approximately two miles from the Project Area. No structure is, however, apparent in aerial photographs or maps. Because of the limited information on this structure, it has been noted on Map 4.

3.6.2 Impacts
No known archaeological sites are documented in the Project Area or the Cultural Study Area (a 12 mile radius around the Project Area). The area surrounding the Project Area does not seem to have the same high prehistoric archaeological potential as the Grand Meadow Quarry Archaeological District located approximately 7.5 miles north of the Project Area. The need for a Phase I field survey will be determined in consultation with SHPO. However, the MN State Archaeologist states that construction of the Project has a low likelihood of encountering cultural sites (Personal Communication between Scott Ansinson, MN State Arcaheologist and Jeff Rice, Maxim Technologies February 9, 2006).

3.6.3 Mitigation
If required by SHPO, prior to commencement of any construction, a Phase I Archaeological Survey (pedestrian survey, shovel testing, soil probes) would be conducted within the areas that would be permanently or temporarily impacted during construction or operation of the Project. The footprint of potential disturbances along the length of the line and at all associated facilities, plus a reasonable buffer, would receive a Phase I investigation.

Following the survey, results would be provided to the SHPO and the Office of State Archaeologists to determine whether cultural resources are present. Any unrecorded resources that are found would be evaluated for integrity and potential listing on the National Register of

Historic Places (NRHP). Previously undocumented resources that are eligible for listing on the NRHP will be avoided.

Prior to construction, workers would be trained about the need to avoid cultural properties, about how to identify cultural properties, and about the procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If any archaeological sites are found during construction, the MPUC and Minnesota Historic Society (MHS) would be notified.

3.7 Recreational Resources

3.7.1 Description of Resource

Recreational opportunities in Mower County include: hunting, fishing, snowmobiling, wildlife viewing, campgrounds, and trails. Hunting is permitted in designated Minnesota Department of Natural Resources (MNDNR) wildlife management areas (WMAs), unless posted otherwise. Recreation resources were obtained from MNDNR Public Recreation Information Maps of the Austin area.

Hunting in Mower County focuses mainly on whitetail deer, upland gamebirds and waterfowl. Deer densities within Mower County range from one to five deer per square mile and historical harvest data indicate that hunting efforts and game populations are stable (MNDNR 2004). WMAs are managed to provide wildlife habitat, improve wildlife production, and provide public hunting and trapping opportunities. These MNDNR lands were acquired and developed primarily with funds from hunting license fees. WMAs are closed to all-terrain vehicles and horses because of potential detrimental effects on wildlife habitat. There are two WMAs located within three miles of the Project (Map 2):

- Rustic Refuge WMA located two miles southeast of the HVTL route.
- Cartney WMA located nearly three miles east-southeast of the project substation.

The Shooting Star Prairie State Natural Area (SNA) is located approximately three miles southeast of the Project on the south side of Highway 56. SNAs protect rare and endangered species habitat, unique plant communities and geologic features that possess exceptional scientific or educational values. SNAs are open for observation, education and research, but are closed to most other recreational activities unless otherwise noted.

One State Park is located within the vicinity of the Project Area. Lake Louise, a 1,170 acre state park, is located approximately 6 miles southeast of the Project Area. The park is valued for its open landscape and lush hardwood forest.

3.7.2 Impacts

Recreational activities would not be significantly impacted by the Project. Game populations within Mower County would not decline as a result of the Project. Likewise, the Project would not reduce the camping or hiking opportunities. Visual impacts would be the most evident impact to people who use the WMAs and SNAs for recreation.

Recreationists in the towns of Grand Meadow, and LeRoy would not be visually affected by the Project because they are not within close proximity. However, the town of Taopi is located within one mile of the Project Area and recreationists in those towns may experience visual impacts.

3.7.3 Mitigation

The Project Area does not contain WMAs, SNAs, state parks or other areas with exceptional value for recreation; therefore, no mitigative measures will be required.

3.8 Public Health and Safety

3.8.1 Description of Resource

Air Traffic

The nearest airport is located in Austin, Minnesota, which is over 10 miles from the Project Area. However, due to the fact that the vast majority of current land use is agriculture, aerial spraying or crop dusting is employed periodically. Crop dusting is typically carried out during the day by highly maneuverable airplanes or helicopters. The proposed overhead HVTL is expected to be similar to those already present throughout the region.

Electromagnetic Fields

Extremely low-frequency electric and electromagnetic fields (ELF-EMF) may currently exist near the Project where electric conductors exist with an electrical current flow. EMFs result from electrically charged particles which may cause effects some distance from the line. The electrical effects relating to a HVTL would be characterized as “corona effect” or “field effect”. Examples of conductors to be used in the Project include an HVTL, distribution (feeder) lines, substation transformers, house wiring, and electrical appliances. HVTLs are not fundamentally different from other electrical conductors and also exhibit ELF-EMFs.

Since 1979, there has been considerable attention focused on understanding the effects of electric and magnetic fields (EMF) on humans. The question of whether exposure to power-frequency (60 Hz) magnetic fields can cause biological responses or even health effects has been the subject of considerable research for the past three decades. There is presently no Minnesota statute or rule that pertains to magnetic field exposure. The most recent and exhaustive reviews of the health effects from power-frequency fields conclude that the evidence of health risk is minimal. The National Institute of Environmental Health Sciences (NIEHS) issued its final report, “NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields” on June 15, 1999, following six years of intensive research. NIEHS concluded that there is little scientific evidence correlating ELF-EMF exposures with health risk.

The Minnesota State Interagency Working Group on EMF Issues, consisting of members from the Minnesota Department of Health (MDH), Department of Commerce, Public Utilities Commission, Pollution Control Agency, and Environmental Quality Board conducted research related to EMF, which resulted in similar findings to the NIEHS report. The group issued “A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options” in September of 2002 wherein it concluded:

- Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, and some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer.

- The MDH concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of health risk from EMF cannot be dismissed.

The conclusions of the Minnesota State Interagency Working Group are also consistent with those reached by the MDH in 2000 and the 1999 Final Report by the NIEHS.

Security and Safety
The Project is located in a rural area with relatively low population. Construction and operation of the Project would have minimal impacts on the security and safety of the local populace.

Traffic
Discussions regarding traffic impacts are discussed previously in Section 3.4

3.8.2 Impacts

Air Traffic
The Project will have no significant impacts on air traffic in the region because there are no airports in the vicinity of the Project Area. The height of the HVTL will be similar to other HVTLs in the area and would restrict low level aircraft use to a similar extent.

Electromagnetic Fields
While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields potentially can cause biological responses or even health effects continues to be the subject of research and debate. Based on the most current research on electromagnetic fields, facilities such as those comprising the Project are not expected to have significant impact to public health and safety due to ELF-EMF. The addition of these transmission facilities is not expected to add significantly to the presence of ELF-EMF exposure in the vicinity.

Security and Safety
Project construction and operation will have no significant impact on the security and safety of the local community. Some additional risk for worker or public injury will exist during the construction phase, as it would for any large construction project. Work plans and specifications would be prepared to address worker safety during Project construction and all work completed on the Project would be OSHA compliant.

Traffic
Motor vehicle traffic in the vicinity of the Project Area would temporarily increase during the construction phase. The maximum construction workforce is expected to generate approximately 100 additional vehicle trips per day. Since many of the area roadways have minimal ADT, the addition of 100 vehicle trips may be perceptible, but would still be less than seasonal variations such as autumn harvest. Traffic management and control of the local roadways would be considered in the forward planning and implementation of the Project construction, especially when crossing public roads. With these measures, the potential for a traffic fatality is low; consequently, an increase in risk to local residents or increase in injuries and fatalities related to traffic is not anticipated.

3.8.3 Mitigation

Air Traffic
The Applicant will light the towers as required to comply with FAA requirements.

Electromagnetic Fields
No impacts due to ELF-EMF are anticipated and therefore no mitigation is necessary.

Traffic
The traffic projections for construction will not significantly impact public health and safety because the local roads are designed to carry many more than 100 additional trips per day. No mitigation is necessary.

3.9 Hazardous Materials

3.9.1 Description of Resource

A thorough regulatory database search for hazardous waste sites did not identify any hazardous waste sites in the vicinity of the Project Area. Potential hazardous materials within the vicinity of the Project Area would be associated with agricultural activities, and include petroleum products (fuel and lubricants), pesticides and herbicides. Older farmsteads may also have lead-based paint, asbestos shingles, and polychlorinated biphenyls (PCB) in transformers. Trash and farm equipment dumps are common in rural settings.

The only fluid present in Project equipment is mineral oil that is essential to the proper function of the equipment.

3.9.2 Impacts

The Applicant does not anticipate encountering any hazardous waste sites. Mineral oil will be the only fluid contained within the electrical transformer.

3.9.3 Mitigation

Because there are no proposed impacts to hazardous waste sites, no mitigative measures are necessary. If any wastes are generated during any phase of the Project, they will be handled and disposed of in accordance with applicable local, state and Federal regulations.

3.10 Effects on Land Based Economies

3.10.1 Description of Resource

The majority of the site is cultivated farmland, with corn and soybeans being the predominant crops. Further emphasizing this land use, nearly all of the soil near the Project Area is designated prime farmland due to the high suitability of the soils for agricultural production. Drain tiles have been installed to improve drainage and enhance productivity of soils where drainage was the limiting factor. Land cover, farmland, vegetation, and artificial drainage are further discussed in the soils and vegetation sections. An illustration of the local land uses and land cover is shown on Map 5.

Economically important forestry is not found in the vicinity of the Project Area, with the only existing trees occurring in association with homes in the form of woodlots and along drainages. With the exception of scattered gravel pits, the region does not have a significant amount of minable resources.

3.10.2 Impacts

The loss of agricultural land to the construction of the Project will reduce the amount of land that can be cultivated. Only a very small percent of the total acreage within the Project is directly impacted by transmission poles, substation, associated laydown areas, and temporary disturbances by equipment traffic. The estimated acreage of permanent facilities for the Project is shown in Table 3-6. An additional 10 acres will be temporarily disturbed as a construction laydown area for both the HVTL and turbine construction.

Table 3-6. Summary of Total Permanent Surface Disturbance.

Facility	Acres
HVTL (at 20 structures per mile)	0.18
New Substation	2.0
Total acres	2.18

During lease negotiations and facility micrositing, discussions with property owners will identify features on their property, including drain tile, which should be avoided. Impacts to drain tile are anticipated during Project construction. Damage to drain tile or other property resulting from construction activities or operation of the Project will be repaired according to the agreement between the Project owner and the property owner.

3.10.3 Mitigation

Only land required for permanent facilities will be taken out of crop production. Once the HVTL towers are constructed, prompt reclamation will allow the surrounding land to be farmed. In the event that there is damage to drain tile as a result of construction activities the Applicant will work with affected property owners to repair the damaged drain tile in accordance with the agreement with the owner of any damaged tile. Non-recoverable impacts to land-based economics will be mitigated through landowner compensation determined through negotiation.

3.11 Tourism and Community Benefits

3.11.1 Description of Resource

At present, there is no significant tourism in Mower County. Wildlife management areas, public parks, and local events create some tourism in the region.

3.11.2 Impacts

No impacts are anticipated to tourism resources.

3.11.3 Mitigation

No impacts on tourism are anticipated, and as such, no mitigation is necessary.

3.12 Topography

3.12.1 Description of Resource

As a result of periodic glaciations, the topography of the site is relatively flat with minimal relief and somewhat poor drainage as shown on Map 6. Gently rolling hills with gentle side slopes ending in drainage ways characterize the area surrounding the Project Area. Elevations in Mower County range between 1,150 feet MSL along the Cedar River in the southwest part of the county to 1,440 feet MSL along drainage divides in the central part of the county. The Project crosses a landscape with relatively high elevations for Minnesota, being located along the central divide at 1,350 to 1,420 feet MSL.

3.12.2 Impacts

No impacts to topography are anticipated. Transmission towers and temporary access will not require significant excavation or fill.

3.12.3 Mitigation

No impacts are anticipated, and as such, no mitigative measures are necessary.

3.13 Soils

3.13.1 Description of Resource

Due to the dominance of farming as a land use in Mower County, soil is an important resource to landowners. Only one soil association (Tripoli-Oran-Readlyn) is present in the Project Area (SCS 1989). A soil association is a mapping unit used to delineate a landscape that has a distinctive pattern of soils. It is composed of one or more major soils and some minor soils, and is named for the major soils. A soil association map is useful in comparing the suitability of large areas, such as that crossed by the HVTL, for general land uses. A description of this soil association follows.

*The Tripoli-Oran-Readlyn Associatio*n consists of nearly level and gently sloping, poorly drained and somewhat poorly drained, silty soils on glacial till plains. This association consists of low ridges separated by broad drainage ways. Relief ranges from 20 to 50 feet. A well-formed, dendritic drainage system dissects this association. This association makes up about 55 percent of the county. The association comprises the vast majority of the Project Area and consists of

about 35 percent Tripoli soils, 25 percent Oran soils, 15 percent Readlyn soils and 25 percent soils of minor extent.

The Tripoli soils are nearly level and poorly drained, typically found in drainage ways and shallow depressions. The surface layer is black silty clay loam about 10 inches thick. The subsurface layer is dark grayish-brown silt loam about six inches thick. The underlying material is yellowish brown mottled loam to a depth of 60 inches. The Oran soils are level to gently sloping, poorly drained areas found on low ridges. The surface layer is dark gray silt loam that is eight inches thick. The subsurface is dark grayish-brown silt loam that is six inches thick. The underlying material is yellowish brown mottled loam to a depth of 60 inches. The Readlyn soils are level and somewhat poorly drained on low ridges. The surface layer is black silt loam that is eight inches thick. The subsurface layer is black and very dark grayish-brown silt loam that is about nine inches thick. The underlying material is yellowish-brown, mottled, firm, calcareous loam to a depth of 60 inches.

Soils Management

The primary soils management method for soils in the Project Area include drainage management and erosion control. In most areas, artificial drainage such as tiling and excavated channels is needed. Some soils are so wet that crop production is impractical unless they are artificially drained. Water erosion and blowing soil are concerns for most soils in the Project Area. Erosion control practices and conservation tillage provide a protective surface cover, reduce runoff and increase infiltration of water.

Prime Farmland Soils

Prime farmland is land that has the best combination of physical and chemical characteristics for use as cropland, pastureland, rangeland, or forestland, but not urban built-up land or water. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when managed according to acceptable farming methods. Specifically, prime farmlands have an adequate water supply, favorable temperature and growing season, acceptable pH and salt content, and few rocks. Prime farmlands are not excessively erodible or saturated with water for long periods of time. Based on the County Soil Survey, all soils in the Project Area, with the exception of a few very wet areas along drainages, are prime farmland or could be converted to prime farmland with adequate drainage.

3.13.2 Impacts

Construction activities including road construction and turbine pad excavations will result in surface disturbances in the Project Area. Topsoil could become contaminated or lost if protective measures are not taken as an initial step in project construction. Excavations can leave soil exposed and susceptible to wind and water erosion if mitigation measures are not implemented. Increased surface traffic can lead to compaction if soils are moist and mitigation measures are not implemented.

3.13.3 Mitigation

Initial project development will include soil removal from areas of HVTL tower footings. Soil will be salvaged to a depth of as much as 12 inches in order to preserve the desirable physical and chemical properties of the topsoil. The topsoil will be bladed to the side and placed on top of

adjacent soils in a manner that will make it available for future reclamation should these facilities ever be removed.

A National Pollutant Discharge Elimination System (NPDES) permit application to discharge storm water from construction activities will be acquired prior to construction. As part of this application, a stormwater pollution protection plan (SWPPP) will be developed to minimize soil erosion. This plan will identify best management practices (BMPs) to be employed during construction of the Project to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored material.

Compaction will be minimized by salvaging topsoil prior to construction and tilling soil as part of the final reclamation treatment measures. In addition, minimizing the total area required by all facilities will limit the area exposed to compaction due to surface activity.

Through implementation of these environmental protection measures, soil erosion, compaction, and other related disturbance will be short-term. With the proper implementation of environmental protection measures intended to prevent, minimize, and/or reclaim soil erosion, compaction, and spill effects, no unmitigated loss of highly productive soil will result from construction and operation of the Project.

3.14 Geologic and Groundwater Resources

3.14.1 Description of Resource

The baseline geology of the general area surrounding the Project was determined through review of documents describing the local geology of Mower County (MNDNR 2002; Mossler 2000 and 1998). The surficial geology consists of glacial till, which is chiefly composed of unsorted silt and clay sediments containing pebbles, scattered cobbles, and boulders. Till thickness ranges from 50 to 200 feet.

Underlying the glacial till are bedrock formations of Middle Devonian age. The uppermost bedrock unit is the Coralville Formation, underlain by the Hinkle, Eagle Center, Chickasaw and Bassett Members of the Little Cedar Formation. The Pinicon Ridge Formation underlies the Little Cedar Formation.

The Coralville Formation is primarily a light brown to gray-orange to yellowish-gray, very fossiliferous, thick-bedded dolostone with some gray-green shale interbeds as thick as several feet. The Hinkle and Eagle Center Members consist of yellow-gray dolostone that is thin-bedded and contains interclasts, dessication cracks, and some thin pale green shale beds. The Chickasaw Member consists of silty, light-gray shale and is approximately 40 feet thick. The Bassett Member consists of light- to medium-gray, argillaceous, thick-bedded dolostone. The Pinicon Ridge Formation also consists of light- to medium-gray, argillaceous, thick-bedded dolostone.

The synclinal folding of these sedimentary bedrock layers along the axis of the Hollandale embayment results in gentle slope to the south to southwest. It is unlikely that bedrock would outcrop in the Project Area.

The principal aquifers in the vicinity of the Project Area are the Upper Cedar Valley Aquifer and the Lower Cedar Valley Aquifer. The Chickasaw Member, a silty shale, lies stratigraphically between the aquifers and acts as an aquitard, or vertical barrier to water flow. The Upper Cedar Valley Aquifer is comprised of the Coralville Formation, Hinkle Member, and Eagle Center Member, which are dolostone rocks. Although the primary permeability of the dolostone is not very high, the secondary permeability of the dolostone is much greater due to joints, fractures, and bedding planes in the rock, and numerous voids due to dissolution. In the area surrounding the Project Area, this aquifer is 50 to 100 feet thick and generally occurs at depths greater than 75 feet below ground surface. Groundwater in these bedrock formations is confined and generally flows toward the southwest.

The Lower Cedar Valley Aquifer is comprised of the Bassett Member and Pinicon Ridge Formation, which are also dolostone rocks. The permeability of this aquifer is similar to the Upper Cedar Valley Aquifer. This aquifer is 60 to 70 feet thick in the vicinity of the Project Area and generally occurs at depths greater than 100 feet below ground surface. Groundwater in this aquifer is also confined and generally flows toward the west.

The MDH County Well Index was reviewed for the vicinity of the Project Area and a total of 53 domestic wells were identified. Groundwater resources for these wells are derived from the Upper Cedar Valley Aquifer in the central and southern portion of the Project Area and the Lower Cedar Valley Aquifer in the northeastern portion of the Project Area. The average depth of these wells is 162 feet below ground surface. No wells were completed in the glacial till sediments as water yields in these sediments are very low.

3.14.2 Impacts

Impacts for geologic and groundwater resources are not anticipated.

3.14.3 Mitigation

Construction of the Project is not expected to impact existing domestic water wells because the route is typically located over 500 feet from occupied residences where wells most commonly occur. Also, the tower footings are generally not deeper than 15 feet below ground surface, which is in the glacial till sediments and stratigraphically higher than the top of the Upper Cedar Valley Aquifer. This aquifer is 50 to 100 feet thick in the Project Area and generally occurs at depths greater than 75 feet below ground surface.

3.15 Surface Water and Floodplain Resources

3.15.1 Description of Resource

Surface water and floodplain resources adjacent to the Project Area were identified by reviewing U.S. Geological Survey topographic maps and Flood Insurance Rate Maps produced by the Federal Emergency Management Agency (FEMA). An illustration of the hydrologic resources in the vicinity of the Project Area is shown on Map 7. The predominant surface waters in the vicinity of the site are portions of the South Branch Root River, Little Iowa River, Upper Iowa River, and North Branch Upper Iowa River. Wetlands adjoin most of the drainages as described in Section 3.1.15 of this document. The shallow hydrogeologic gradient is not known for all areas, but may be inferred to be parallel to the topographic gradient. There are no natural lakes in

the vicinity of the Project Area. The FEMA Floodplain maps identify all portions of the Project Area as Zone C – minimal flooding and outside of the 100 year flood plain.

3.15.2 Impacts

On-site or off-site flooding would not likely result from the construction of the Project. Implementation of environmental protection measures such as installation of adequately-sized and appropriately placed culverts, and avoidance of channels and other areas of concentrated flow, would ensure that such on-site or off-site flooding does not occur. The transmission towers will be placed on uplands, and this will avoid streams located in topographically lower positions in the landscape.

3.15.3 Mitigation

If it is determined that the Project will impact U.S. or Minnesota Public Waters, the Applicant will apply for the necessary permits prior to construction. Access roads constructed adjacent to streams and drainage ways will be designed in such a manner that runoff from the upper portions of the watershed can flow unrestricted to the lower portions. A NPDES permit application and SWPPP will be prepared by the Applicant and submitted to the MPCA prior to the construction of the Project. Compliance with this permit and the associated SWPPP will ensure that surface water is not adversely affected by runoff from disturbances and construction areas. If required to protect navigable waters (e.g. surface waters), a Spill Prevention, Control, and Countermeasure (SPCC) plan will be developed. The SPCC plan will address any secondary containment or other required measures needed to protect navigable waters from petroleum spills or leaks.

3.16 Wetlands

3.16.1 Description of Resource

A site reconnaissance visit was completed during the period of January 6 to January 10, 2006 with the objective of characterizing habitats, wildlife, and identifying wetlands and other aquatic sites which could potentially be impacted by the proposed development. Wetlands preliminarily identified as falling under the jurisdiction of state or federal agencies will be delineated in the spring of 2006. Ongoing consultation and the results of these delineations will determine if local, state or federal wetland development permits will be required. Literature review, queries of state and federal natural resource-related databases, and interviews of state and federal management personnel were the primary sources used for the background investigation.

Wetland resources in the vicinity of the Project Area have been highly modified. Wetland resources have been converted to agricultural production by implementing systems or practices (e.g., channelizing, deepening and/or tiling) designed to facilitate water removal, leaving the land more suitable for agricultural row-crop production. The small amount of woody habitat present in the Project Area is generally restricted to small riparian corridors bordering these highly modified drainages and/or planted shelterbelts around residential and livestock/feedlot areas. Wetland resources in the vicinity of the Project Area are depicted on Map 7.

3.16.2 Impacts

Most construction activities associated with the Project would occur outside of ephemeral channels and the depression cone of wetlands. However, the HVTL route bisects ditches and

ephemeral drainages and construction of these facilities could result in some temporary disturbances to wetlands.

Temporary impacts to wetlands or waters may occur where access for construction requires installation of temporary crossing structures at channels, wetlands, or other wet areas. If required at these sites, one of the following types of temporary crossings would be constructed:

1) At-grade crossings without dredge or fill of wetlands, possibly including wetland crossings using wooden matting; or
2) Culverted crossings using geotextile, coarse rock fill and culverts.

Equipment crossings in wetland areas which do not have defined channels would be restricted to crossing on wooden mats to prevent compression and or disturbance of wetland soils. Areas with water in defined channels would be crossed at temporary, at-grade crossings or culverted crossings to prevent permanent impacts to these areas. Crossing of areas which have a combination of a defined channel and adjacent wetland areas may require the use of wooden mats and installation of a temporary at-grade or culverted crossings. Based on site observations made during January 2006, as many as five crossings may be required in association with the overhead HVTL construction (Map 7).

3.16.3 Mitigation

Wetlands will be avoided to the extent practicable during construction of the Project. However, as many as five sites may require temporary crossings for access during construction and operation of the Project. If wetland impacts cannot be avoided, the Applicant will submit any required permit applications to the U.S. Army Corps of Engineers, State or local government prior to construction. Wetlands in Minnesota are regulated under a variety of local, state, and federal programs. Many times two or more of these programs have jurisdiction over a particular wetland or waterway. In some cases, various portions of the same wetland will be regulated by different programs.

Where crossings are required, construction activities would include implementation of BMPs to control erosion and otherwise minimize impacts to wetland properties. Fill material placed below the high water mark would be free of topsoil, decomposable materials, and toxic concentrations of persistent synthetic organic compounds. Temporary crossings would be inspected after runoff-producing rains to check for blockage of channels, erosion of abutments, channel scour, riprap displacement, or piping. All repairs would be made immediately to prevent further damage to the installation. Permanent crossings will be similarly inspected and regularly maintained as necessary to minimize impacts.

Temporary crossings would be removed immediately when they are no longer needed. All construction materials (e.g., rock, geotextile fabric, culvert, etc.) would be removed and the site would be restored to its original grade. The disturbed area would be smoothed and appropriately stabilized with silt fence or erosion control blankets as necessary to control erosion. The site would be seeded with local native species adapted to site conditions as necessary to promote prompt revegetation. Due to the temporary nature of impacts, it is likely that onsite propagules (e.g., living plants and seeds) would regenerate vegetative cover similar to that found prior to the

disturbance without additional seeding. Silt fences would remain in place to continue capturing sediment until the crossing site is fully stabilized and revegetated as determined in consultation with USACE (US Army Corps of Engineers). Soils at risk of erosion would be identified prior to disturbance and the need for placement of additional silt fence or erosion control matting would be evaluated and implemented as needed.

If required by agencies governing wetland resources, off-site mitigation of wetland losses will be employed to reduce the overall effect of the Project. The Applicant will work with local, state, and federal agencies to minimize or avoid disturbances which would require mitigation through creation of new wetlands.

3.17 Vegetation

3.17.1 Description of Resource

The Project Area is in an area predominantly used for agriculture with scattered rural residences. The dominant land cover is row-crop agriculture, with minor amounts of pasture/hayland. Native grasslands are virtually non-existent within the vicinity of the Project Area and none are found within the Project Area. Some grasslands exist in association with modified drainages, as filter strips located between drainages and row-crop production areas. However, most of these areas appear to be hayed or mowed on an annual basis. A summary of the various land uses and cover types in the Project Area is provided in Table 3-5.

Table 3-5. Summary of Land Uses and Cover Types in the Project Area

Land Use / Land Cover Class	Percent within 0.25 miles of HVTL
Commercial/Industrial/Transportation	1.0%
Deciduous Forest	1.5%
Pasture/Hay	8.2%
Row Crops	88.1%
Woody Wetlands	0.3%
Emergent Herbaceous Wetlands	1.0%

Source: (USGS 1992)

Minimal, highly-fragmented areas in the vicinity of the Project contain deciduous/coniferous forest, woody wetlands and emergent herbaceous wetlands. Woody habitat is generally restricted to small riparian corridors bordering highly modified drainages, and/or planted shelterbelts around residential and agricultural buildings or livestock/feedlot areas. The route of the HVTL will cross one wooded drainage and potentially one shelterbelt.

3.17.2 Impacts

HVTL towers will typically be located in agricultural production areas whenever possible to limit impacts to riparian habitats. Where the overhead HVTL crosses wooded drainages or shelterbelts, some removal of woody vegetation may be required. Removal will depend on tree heights at the crossing locations and minimum vertical clearances required for the overhead lines.

3.17.3 Mitigation

Grassland and forested areas will be avoided during construction of the Project as practicable. Landowner approval will be negotiated prior to any removal of trees during construction.

3.18 Wildlife

3.18.1 Description of Resource

Due to the migratory and transient behavior of many of the wildlife species within the region, the information presented includes a discussion of wildlife resources within the vicinity of the Project Area, as well as at a regional level. The status and distribution of wildlife species was determined based on the completion of a background investigation and a site reconnaissance. A site reconnaissance visit was completed during the period of January 6 to January 10, 2006 with the objective of characterizing habitat and surveying for wildlife. Wetlands, aquatic sites, and other areas of valued wildlife habitat which could potentially be impacted by the proposed development were identified. Literature review, queries of state and federal natural resource related databases, and interviews of state and federal management personnel (Nelson 2005a and 2005b) were the primary information sources for species potentially found in the vicinity of the Project Area. The following section does not include a discussion on wildlife species listed as threatened, endangered or of special concern by state or federal management agencies. Refer to Section 3.1.18, Rare and Unique Natural Resources, for information on these resources.

Wildlife use in the vicinity of the Project Area is largely affected by the types of habitat found there. The dominant landcover is row-crop agriculture, with minor amounts of pasture/hayland. Native grasslands are virtually non-existent within the vicinity of the Project Area. Minimal, highly-fragmented portions of the vicinity of the Project Area contain deciduous/coniferous forest, woody wetlands and emergent herbaceous wetlands. Woody habitat is generally restricted to small riparian corridors bordering highly modified drainages and planted shelterbelts around residential and livestock/feedlot areas. Woody cover-types provide food, hiding and thermal cover, and nesting habitats for a variety of species, especially migratory birds. Resident and migratory birds, mammals, reptiles and amphibians, and insects occupy the region both continually and intermittently throughout the year.

Resident and Migratory Birds

Resident birds are those that occupy the vicinity of the Project Area throughout the year. Appendix C lists the resident birds that can be expected to occur in the vicinity of the Project Area (Henderson 1979; Jansen 2004). Migratory birds are those birds that utilize the area only during the breeding and nesting season. The principal migratory route for many of these species is the Mississippi Flyway. The primary route of this flyway is located west of the Project Area vicinity with only secondary routes being present in the immediate vicinity of the Project Area. The list in Appendix C identifies the migratory birds most likely to use the Project Area. The list in Appendix C should not be considered a comprehensive list of the migratory birds that could potentially occur in the area. However, based on the available information, the migratory birds listed do represent the majority of species regularly present.

Breeding bird surveys and roadside surveys are conducted annually throughout various locations in the state. However, the majority of available trend information on birds focuses on game

species. A review of the MNDNR annual game bird reports for southeastern Minnesota indicates that game bird populations are healthy and stable in this region. Based on the lack of suitable waterfowl habitat present in the vicinity of the Project Area relative to other portions of the state, only limited use of the area by migrating waterfowl species would be expected.

During a site visit conducted in January 2006, several species of birds were observed in or adjacent to the Project Area. These included: ring-necked pheasant (*Phasianus colchicus*), Gray (Hungarian) partridge (*Perdix perdix*), snowy owl (*Nyctea scandiaca*), snow bunting (*Plectrophenax nivalis*), Northern cardinal (*Cardinalis cardinalis*), European starling (*Sturnus vulgaris*), and yellow-shafted flicker (*Colaptes auratus*).

Mammals
The agricultural fields, grasslands, woodlands, and wetland areas provide habitat for a variety of large and small mammals that inhabit the vicinity of the Project Area. Agricultural crops and native flora provide year round food sources and thermal/hiding cover for species. Smaller mammals occupying the grassland and woody vegetation areas provide a food source for larger carnivorous and omnivorous mammals and birds.

White-tailed deer, the dominant big game species in the vicinity of the Project Area, favor the open wooded areas in the region for cover. Deer consume agricultural crops during warmer months and acorns during the winter. A review of the MNDNR Deer Population Model for spring pre-fawning (2005) indicates that deer density within Mower County is approximately one to five deer per square mile. In addition, the Historical Harvest Statistics (1995-2004) have been healthy and stable within Mower County. The list in Appendix C identifies mammals that can be expected to occupy the Project Area throughout the year.

Mammals observed in the vicinity of the Project Area during the January 2006 site visit included: white-tailed deer (*Odocoileus virginianus)*, red fox (*Vulpes vulpes*), eastern fox squirrel (*Sciurus niger)* and raccoon (*Procyon lotor)*. Evidence of beavers (*Castor canadensis*) within the vicinity of the Project Area drainages included lodges, beaver cut trees and food piles. Coyote (*Canis latrans*), rabbit (likely eastern cottontail; *Sylvilagus floridanus*) and various unidentified rodent tracks were observed in the snow during the site visit.

Reptiles and Amphibians
Several reptile and amphibian species may use the grassland, wetland, and deciduous forested areas within the region. However, the majority of these species would be concentrated in wetland or aquatic habitats and these habitats are limited within the vicinity of the Project Area. The list in Appendix C identifies the reptile and amphibian species that may occupy the vicinity of the Project Area throughout the year.

3.18.2 Impacts

General Wildlife Impacts
Construction activities that remove vegetation and disturb soil may cause direct impacts to individuals of less mobile species (e.g., small mammals, amphibians, reptiles) through direct mortality or displacement and exposure to predators. The cultivated croplands where most

disturbances would occur are not considered to be particularly productive habitats for those species because of low habitat diversity. Long term habitat loss resulting from construction of tower foundations, the substation, and any permanent access points that may be required would be minimal and restricted to localized areas. Other construction disturbances, such as those resulting from traffic along the route during construction, would be temporary. Revegetation of disturbed areas would mitigate these short-term effects. More mobile species (medium to large mammals and birds) would be expected to disperse from the area of disturbance and re-enter the area following the completion of construction.

Disturbance to wildlife due to noise, vehicles, and human presence would be localized and of short duration. Vehicles traveling on access roads could kill small mammals, reptiles, or birds, though more mobile species would be able to avoid impacts from vehicles. Nests of ground-nesting birds could be destroyed by vehicle traffic if construction activities occur during spring and early summer months when birds are nesting. However, these losses are not expected to cause a significant decline in overall wildlife populations.

Potential for impacts to individual birds resulting from interactions with the Project does exist. Based on a limited number of studies, waterfowl (including ducks, geese, swans, and cranes) appear to be most susceptible to power line collisions when power lines are located near wetlands. In upland habitats, raptors and passerines appear most susceptible to mortality from interactions with these facilities (NWCC 2004). Habitat in the Project Area is primarily agricultural row crop with limited documented amounts of aquatic and grassland habitats. The HVTL is not expected to bisect daily movement patterns of these species due to the paucity of suitable habitat within the Project Area.

Potential Impacts to Avian and Bat Species within the Project Area
Avian and bat impacts resulting from the construction and operation of the proposed Project are expected to be low. Based on the lack of woody habitat and the current condition of riparian corridors in the vicinity, bat use in the Project Area is expected to be low.

Overall Impacts to Wildlife
The construction and operation of the Project is expected to result in minimal impacts to wildlife and would not reduce the viability of wildlife populations. Some small-scale displacement of wildlife is expected during construction; however, wildlife would likely reoccupy impacted areas shortly after completion of construction activities. Available habitat in the Project Area would be reduced slightly, but the reduction would be a small percentage of the vicinity. Operation and maintenance will not significantly change the existing land use or have an effect on species within the vicinity of the Project Area. While it is possible that impacts to individual birds could occur due to collisions with the proposed HVTL towers and/or cables, there is no evidence to suggest that development of this kind within the Project Area poses a high risk for impacts to wildlife populations.

3.18.3 Mitigation

During consultations with the USFWS, the primary environmental concerns expressed were potential for impacts to wetlands, streams, and forested areas. In addition to minimizing disturbances to these resources, the following proposed mitigation measures include:

1. The location of the Project and associated Wind Farm has been selected, in part, due to the low use of the area by migratory birds and relatively low value of the area for wildlife habitat relative to sites in other portions of the state.
2. Facilities have been sited in locations where impacts to locally important habitats (e.g., wetlands and grasslands) are minimized.
3. Surface disturbances and above-ground facilities have been minimized to the extent practicable and all temporary disturbances will be promptly reclaimed.

Based on implementation of these and other mitigation measures noted elsewhere in this document, no significant impacts to wildlife would be expected to occur due to the construction and operation of the Project.

3.19 Rare and Unique Natural Resources

3.19.1 Description of Resource

For the purpose of this discussion, Rare and Unique Natural Resources are considered to be those species identified as threatened, endangered, candidate or sensitive by state and federal management agencies, or other natural resource features identified by state or federal management agencies to be unique within the region of the Project Area.

Federally-Listed Species
The Endangered Species Act of 1973, as amended, requires protection of those species federally-listed as threatened or endangered, as well as protection of habitat designated as critical to the recovery of those listed species. Projects that could potentially have an adverse effect on listed species or critical habitat require consultation with the USFWS.

The MNDNR maintains a Natural Heritage Database (NHD) through their Natural Heritage Program and Nongame Game Wildlife Program, which is the most complete source of data on Minnesota's rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features. The results of a NHD query for the vicinity of the Project Area and a substantial search radius found that there are no documented sightings of federally threatened or endangered species (MNDNR 2005).

Appendix C contains a table that lists the federally-listed threatened and endangered species found within Minnesota. Of those species, only two species have been documented as occurring in Mower County (Delphey 2005): the Western Prairie Fringed Orchid (*Platanthera praeclara*) and the Prairie Bush-Clover (*Lespedeza leptostachya*).

The threatened plant species that have been documented in Mower County and could potentially occur in the vicinity of the Project Area are protected by the Endangered Species Act, the state's Endangered Species Statute (84.0895) and by Minnesota's 1930 Wildflower law (17.23). As such, a person may not take, import, transport, or sell any portion of these species. Following is a description of the habitat that these plants are typically found in.

Prairie Bush-clover: Prairie bush-clover is a prairie legume that is found only in the tallgrass prairie region of four Midwestern states. The plant is considered to be endemic as it is only found

in the tall grass prairie region of the upper Mississippi River Valley (USFWS 2000). Tallgrass prairie habitat does not occur within the vicinity of the Project Area. Therefore, it is unlikely that this species would be found within the vicinity of the Project Area.

Western Prairie Fringed Orchid: Western prairie fringed orchid grows in moist tallgrass prairies and sedge meadows. Documented sightings indicate that this species is tolerant of some disturbance as it has been found in pastures, ditches and cultivated fields (CCM 2004). The plant is unlikely to occur in the Project Area as there are no tallgrass prairies, and large wetland areas and meadows will be avoided to the extent practicable.

Upon further consideration and consultation, the USFWS determined that there are currently no federally endangered or threatened species known to occur in the vicinity of the Project Area. Therefore, they concluded that that there was no need for further action on this matter as required under Section 7 of the Endangered Species Act of 1973 (USFWS 2005).

State Listed Species

Minnesota's Endangered Species Statute (Minnesota Statutes, Section 84.0895) requires the MNDNR to adopt rules designating species meeting the statutory definitions of endangered, threatened, or species of concern, and authorizes the MNDNR to adopt rules that regulate treatment of designated species. Appendix C contains a list of state-listed threatened and endangered mammals and birds. [A comprehensive list of all state-listed threatened species, endangered species, and species of concern can be found on the MNDNR website at: www.dnr.state.mn.us/est/index.html]

The MNDNR's NHD also maintains records of documented occurrences of state-listed species or other rare and unique species. The results of a NHD query for the vicinity of the Project Area and a one-mile buffer search radius found that there are two occurrences of rare species within the search radius (MNDNR 2005). The species were the Blanding's turtle (*Emydoidea blandingii*) and several species of rare mussels such as Ellipse (*Venustaconcha ellipsiformis)* and Creek Heelsplitter (*Lasmigona compressa).* These species are wetland/aquatic species and, due to the limited amount of wetland habitat in the vicinity of the Project Area, the MNDNR did not have any concerns about impacts from the Project on these species (MNDNR 2005).

Unique Natural Resources

State owned lands that are managed or preserved for their unique qualities include SNAs, WMAs and State parks. The objectives of these areas include: preservation of the ecological diversity of Minnesota's natural heritage, including landforms, fossil remains, plant and animal communities, and rare and endangered species; or other biotic features and geological formations for scientific study and public edification as components of a healthy environment. The Project Area and surrounding area is privately owned and does not contain these management areas. However, several of these state properties are within the region.

The SNA Program's goal is to ensure that no single rare feature is lost from any region of the state. This requires protection and management of each feature in sufficient quantity and distribution across the landscape. The Shooting Star SNA is located three miles southeast of the Project Area on the south side of Highway 56 as previously noted in Section 3.6.1.

Two WMAs are located within three miles of the Project Area as shown on Map 2. WMAs are areas managed to provide recreation and wildlife habitat for a variety of game and nongame species. These areas are predominantly used for hunting; however, they are increasingly being used for wildlife viewing. For more information on these areas, see Section 3.1.6 of this document.

There is one State Park located within the vicinity of the Project Area. Lake Louise is a 1,170 acre state park located approximately six miles southeast of the Project Area. The park is valued for its open landscape and lush hardwood forest.

3.19.2 Impacts

The Project would not impact any federal- or state-listed threatened or endangered species. As previously discussed, the site reconnaissance, consultation with the USFWS (USFWS 2005), and the query of the NHD indicate that there are no federal threatened or endangered species documented to occur within the vicinity of the Project Area. Likewise, these sources indicate that the state-listed or rare species that could potentially occur within the vicinity of the Project Area are species associated with and dependent on wetlands and aquatic areas. Impacts to these areas will at most occur at five locations and will be avoided where practicable. In addition, a variety of mitigation measures will be implemented to avoid and minimize impacts to all wildlife species. For more discussion on mitigation measures, see Section 3.14.2 and 3.15.2 of this document.

Unique resources, such as state management areas and recreation areas, will not be directly impacted by the Project. However, some of the areas may experience indirect impacts, most notably, visual impacts to recreation areas.

3.19.3 Mitigation

There is a variety of mitigation measures associated with various resource areas that will assist in minimizing impacts to rare and unique natural resources. The mitigation measures associated with the Wildlife section, Recreation Resources and Visual Resources are all measures that will protect Rare and Unique Natural Resources. Some specific proposed mitigative measures are:

- HVTL towers will not be located in biologically sensitive areas such as wetlands, relict prairies, or in close proximity to WMAs and impacts to important habitats will be avoided where practicable;

- Existing roads will be used for construction and maintenance where possible, and new road construction will be minimized;

- Access roads created for the wind farm will be located on gentle grades to minimize visible cuts and fills; and

- Temporarily disturbed areas will be reseeded to blend in with existing cover and land uses.

4 Feasibility of Alternatives

The proposed route is preferred because it is shorter than either of the alternate routes and it avoids existing distribution lines to a greater extent. The proposed route also avoids houses more than the alternate routes, as shown in the Figure 3 below.

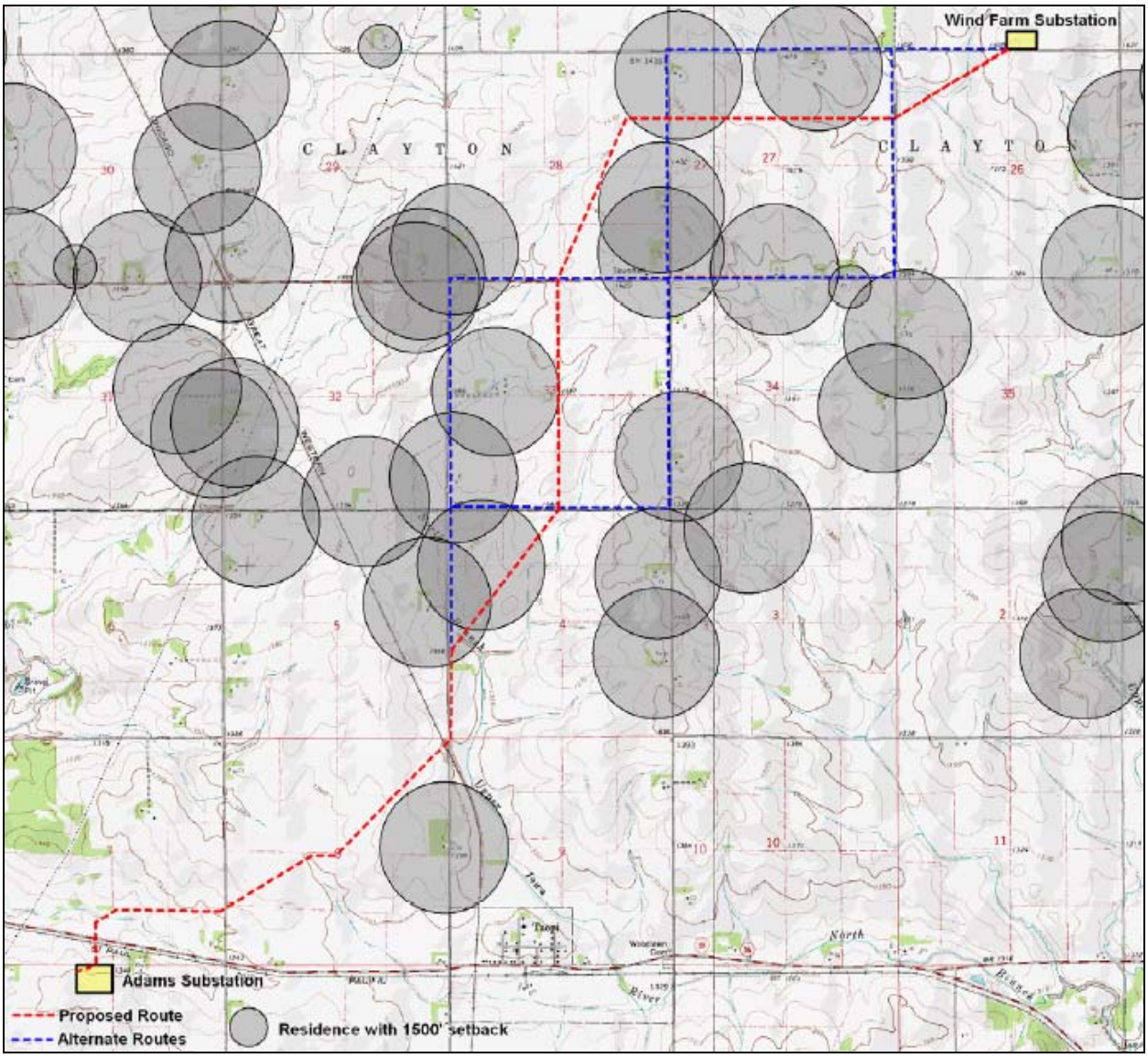

Figure 3 - HVTL Routes and Residences

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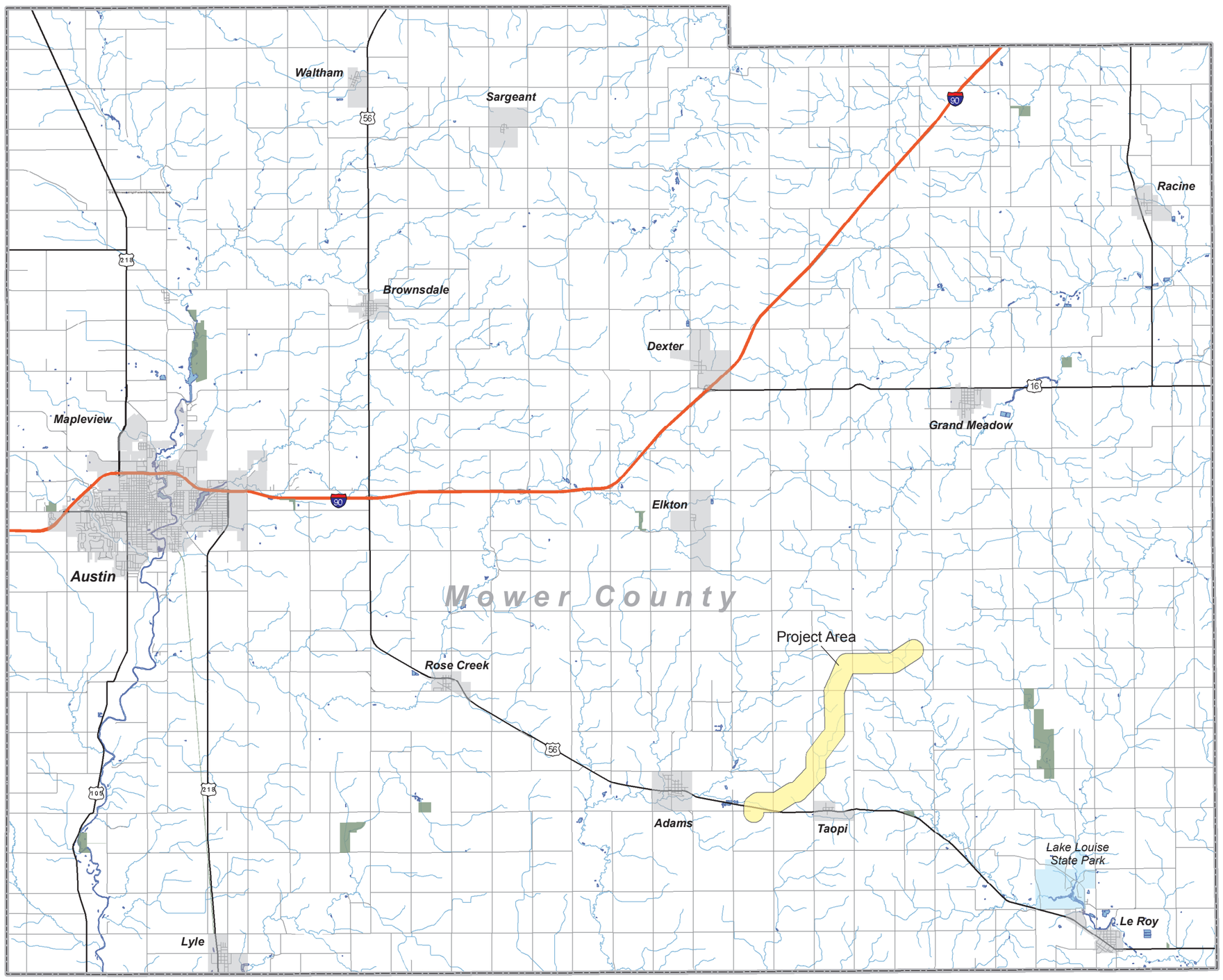
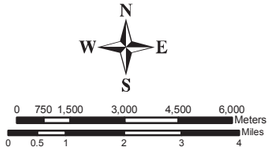


Project Area
Municipal Boundaries
Wildlife Management Areas
State Lands



High Voltage Transmission Line
Project Vicinity
Mower County, Minnesota

Map 1

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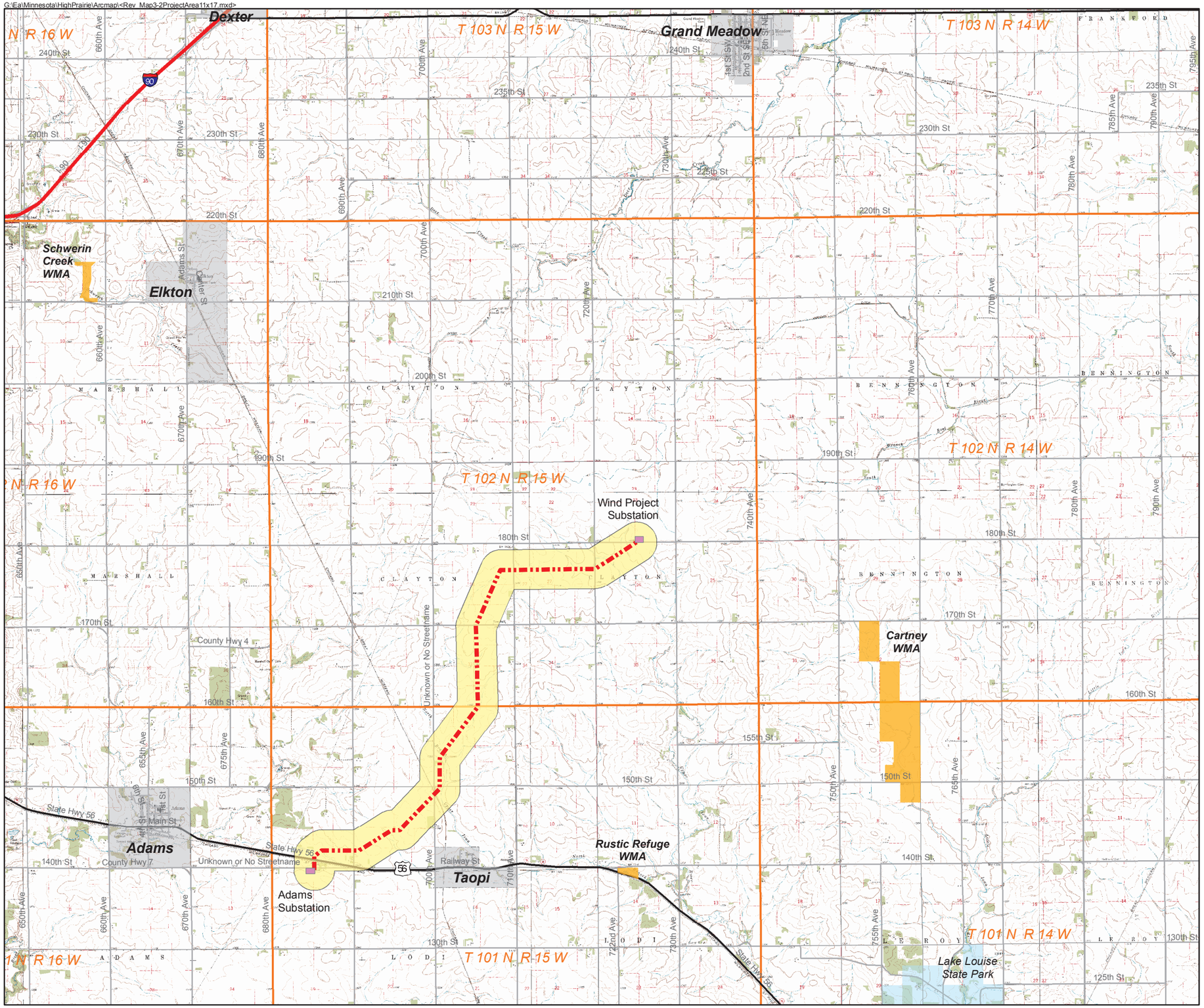
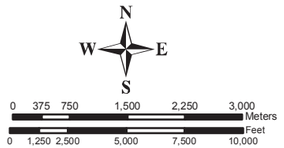


Project Area
Municipal Boundaries
Wildlife Management Areas
State Lands

Facilities

High Voltage Transmission Line
Substation



High Voltage Transmission Line
Project Area
Mower County, Minnesota

Map 2

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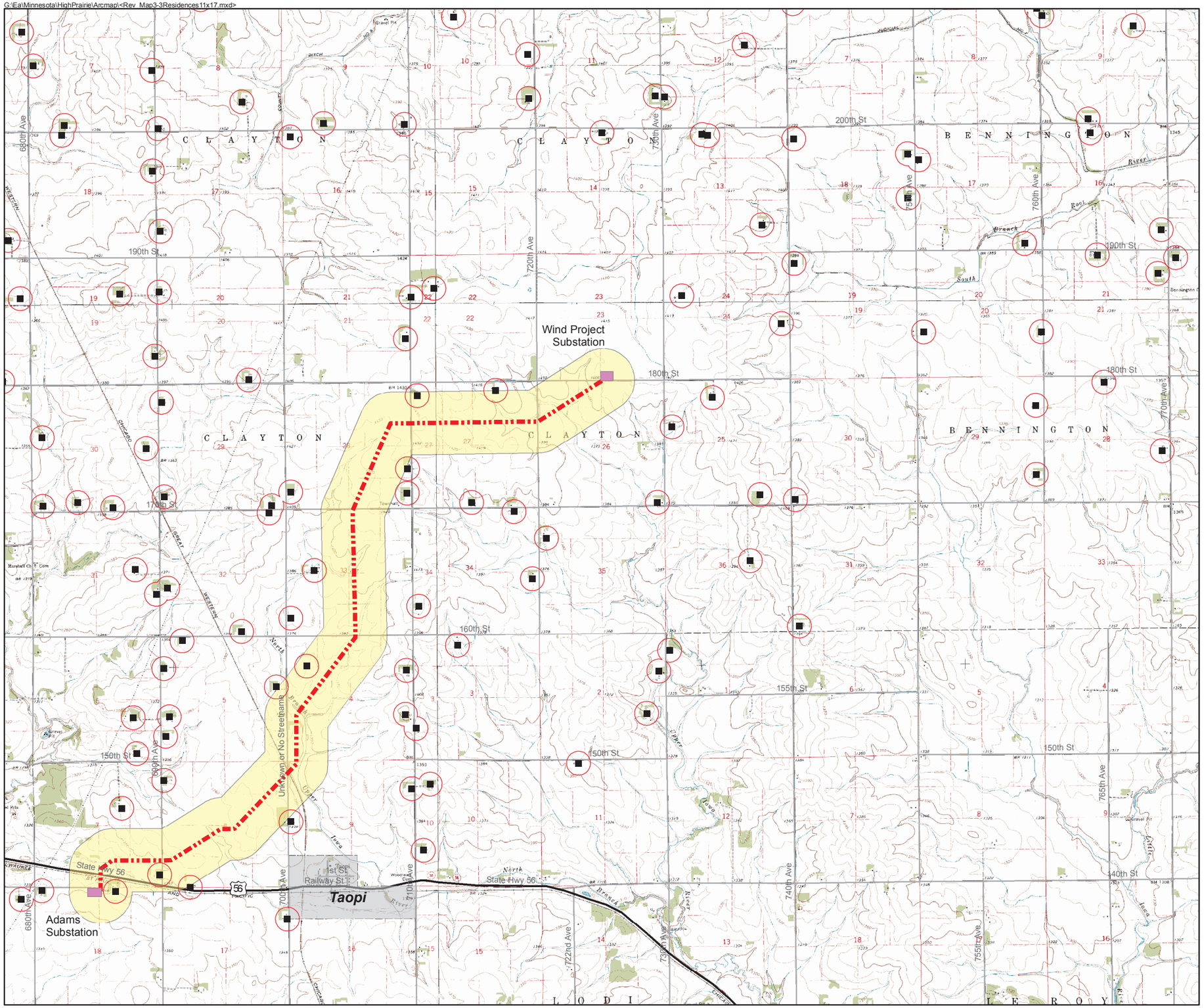
Wind Project Substation
Adams Substation
Taopi
CLAYTON
BENNINGTON
LODI
LEROY
200th St
190th St
180th St
170th St
160th St
155th St
150th St
140th St
680th Ave
690th Ave
700th Ave
710th Ave
720th Ave
730th Ave
740th Ave
750th Ave
755th Ave
760th Ave
765th Ave
770th Ave
722nd Ave
Unknown or No Streetname
State Hwy 56
North
South
Branch
River
Lower
Upper
Iowa
Little
Cedar
Roos
Dutch
Hubbard
Chicago
Great
Western
Railway St
1st St
Taopi
Woodlawn Cem
Marshall Ch T Cem
Harvey Cem
Bennington Ch
Gravel Pit
Townhall
BM 1430
BM 1362
BM 1345
BM 1308
BM 1365
BM 1357
BM 1268
BM 1345
BM 1379
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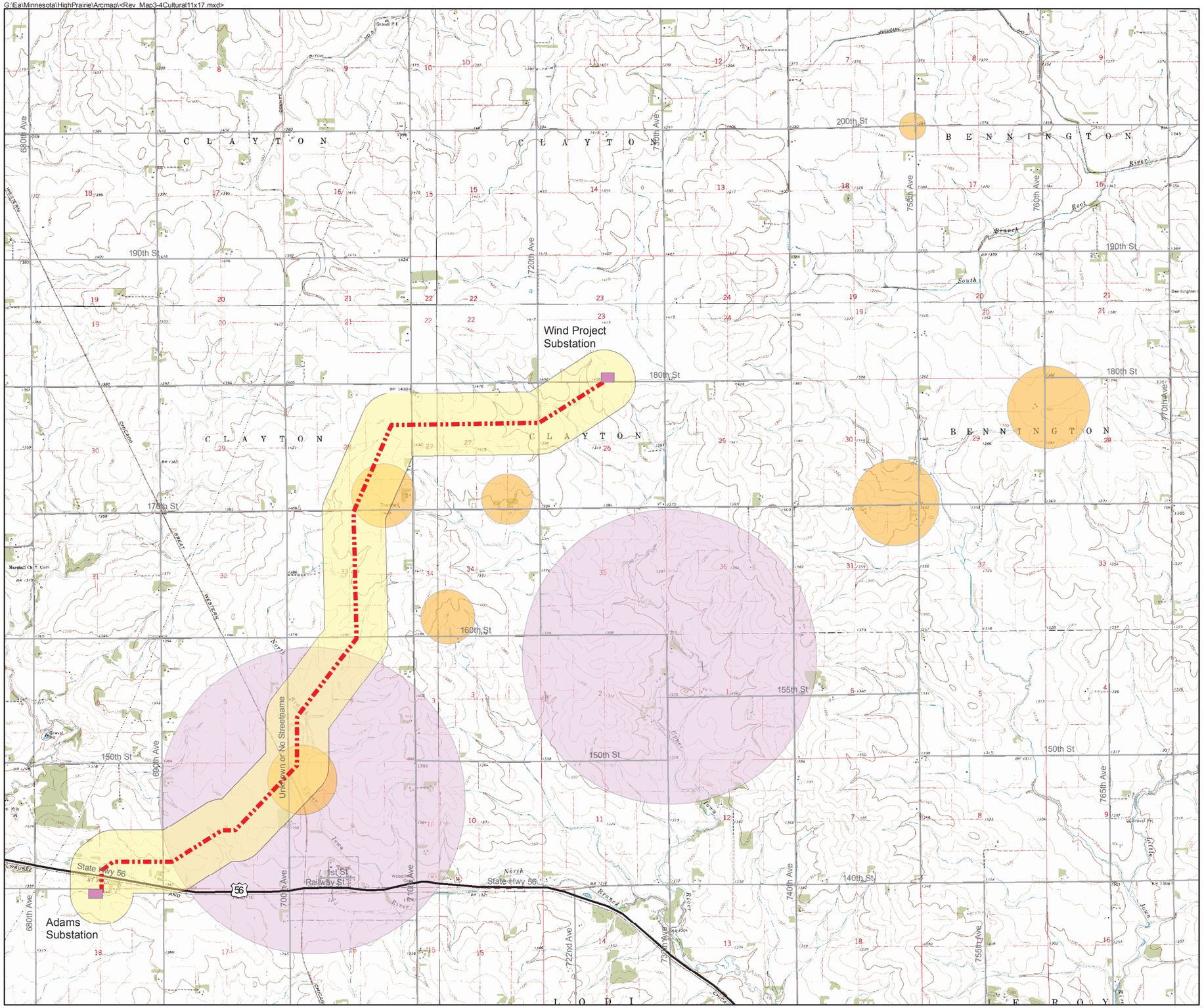

High Voltage Transmission Line
Cultural Study Area
Mower County, Minnesota

Map 4

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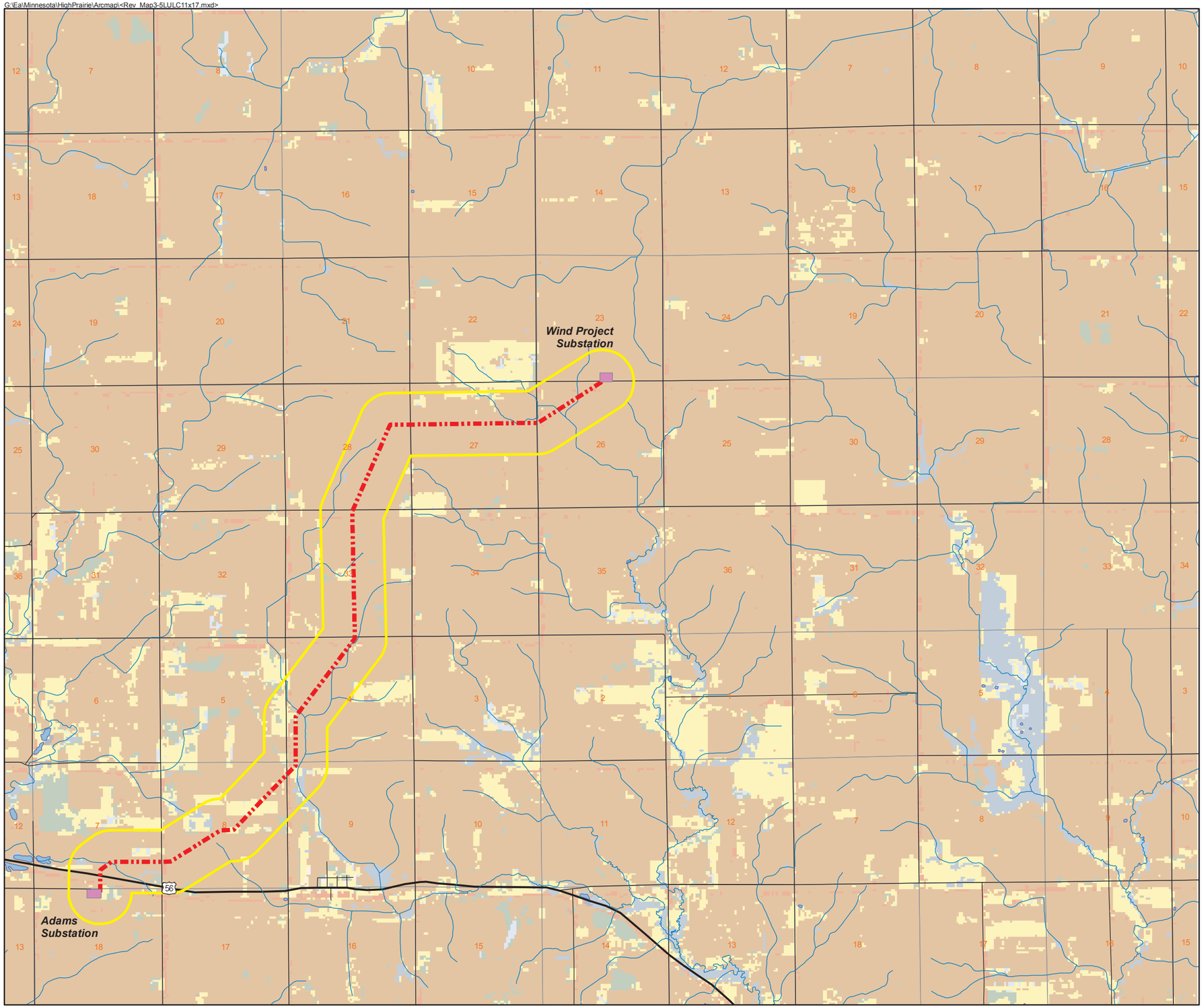

Project Area
Major Road/Highway
Secondary Roads
Lake
Stream/River

Facilities

High Voltage Transmission Line
Substation

LULC Legend

- Open Water
- Low Intensity Residential
- High Intensity Residential
- Commercial/Industrial/Transporation
- Deciduous Forest
- Mixed Forest
- Pasture/Hay
- Row Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

N
W E
S

0 375 750 1,500 Meters
0 1,250 2,500 5,000 Feet

High Voltage Transmission Line
Land Use Land Cover, NLCD Data
Mower County, Minnesota

Map 5

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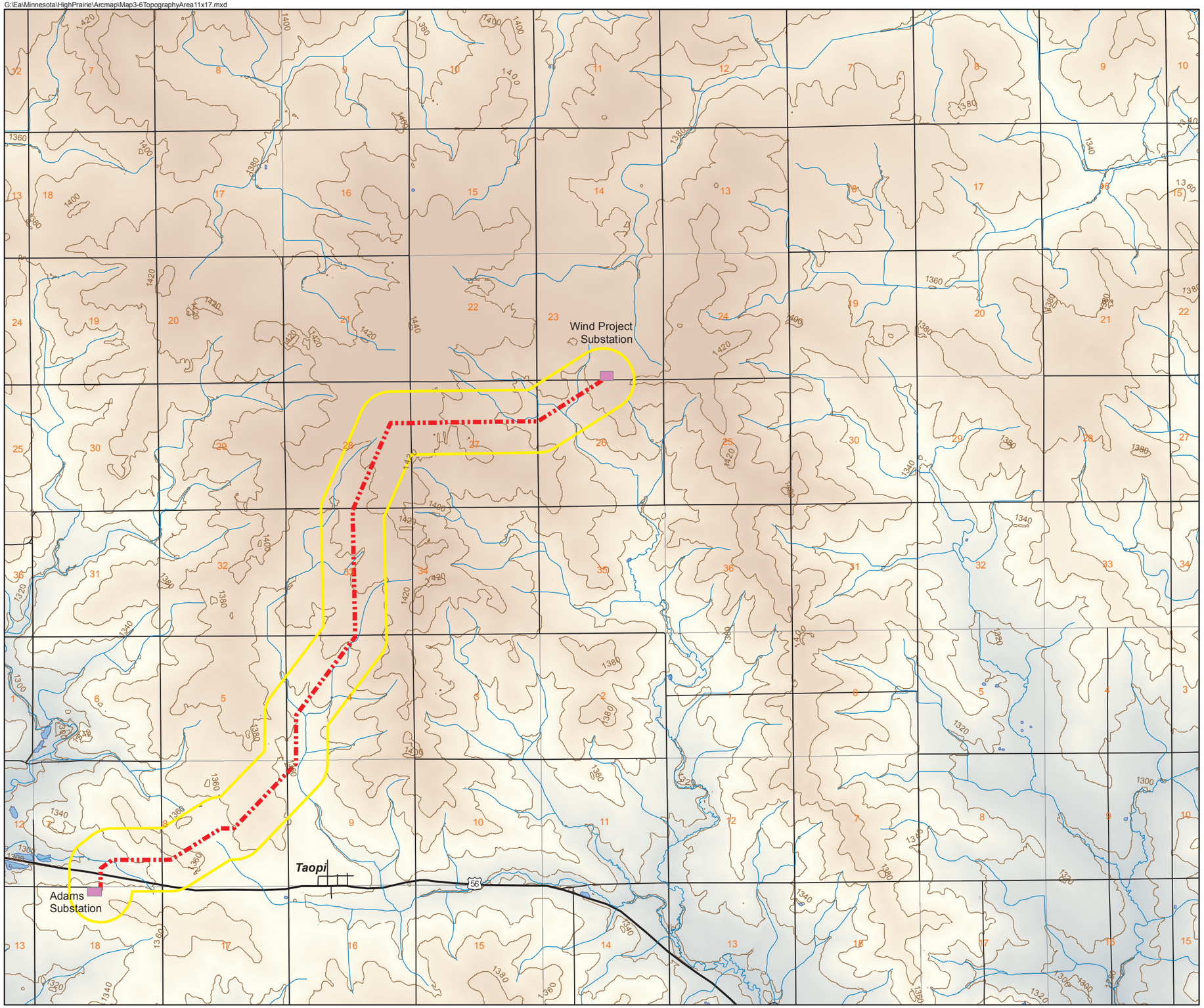


Streams/Rivers

Lakes

Major Road/Highway

Secondary Roads

Elevation

High : 1440 feet

Low : 1220 feet

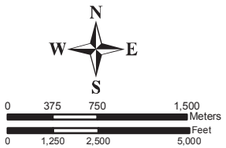
Contour Interval 20'

Project Area

Facilities

High Voltage Transmission Line

Substation



High Voltage Transmission Line
Topography
Mower County, Minnesota

Map 6

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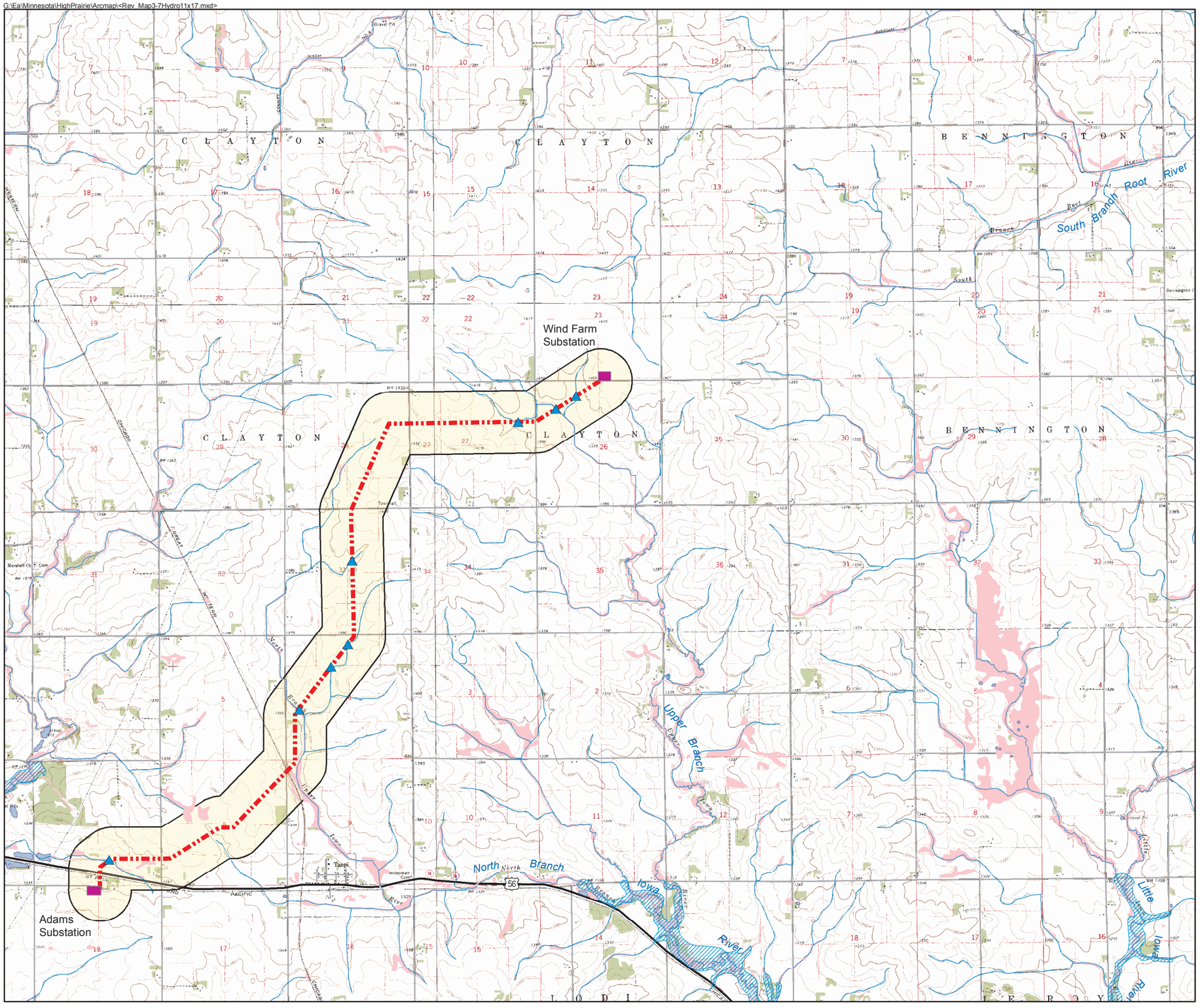

Project Area
Fema Q3 Floodplains
Lake
Stream/River
Wetlands
Wetland/Channel Crossings

Facilities

High Voltage Transmission Line
Substation

N
W E
S

0 375 750 1,500 Meters
0 1,250 2,500 5,000 Feet

High Voltage Transmission Line
Hydrologic Features
Mower County, Minnesota

Map 7